Government of Belize

Ministry of Health

Preconception care and Obstetrics

Primary Health Care

Continuum of Care

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Foreword

The preconception care and obstetrics guidelines for primary health care within the continuum of care was prepared with technical and financial assistance provided by the European Union, and the Pan American Health Organization.

Several national consultations were conducted to get feedback from providers representing public and private health sectors. The objective of the guidelines is to have a standardized approach towards preparing for pregnancy and pregnancy and puerperium related issues. Each topic outlines the tasks to be done at primary health care facilities before referral for specialized care.

It is expected that all sectors utilizes these guidelines when providing basic services for women in reproductive age and during pregnancy, childbirth and puerperium period.

Contents

List of Tables

Acronyms

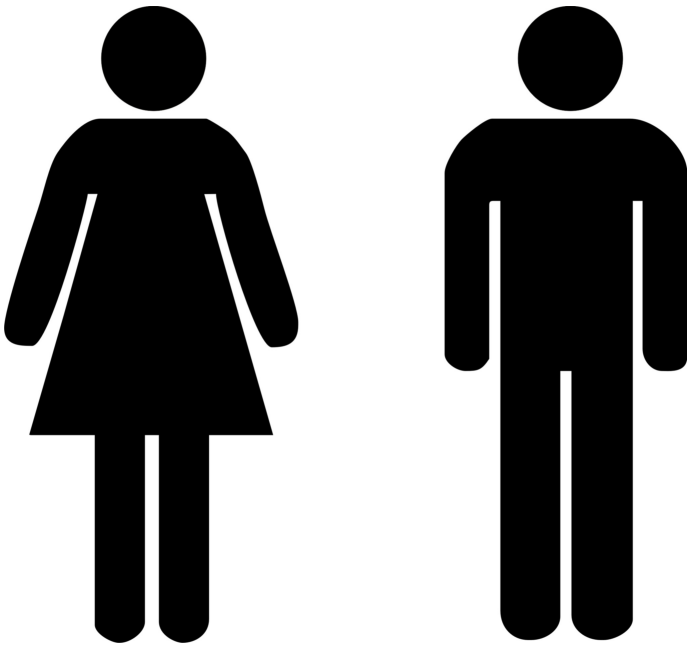
ACEI	**Angiotensin-Converting-Enzyme Inhibitor**
ACT	Artemisinin-based combination therapies
AFI	Amniotic Fluid Index
AIDS	Acquired Immune Deficiency Syndrome
ALT	Alanine Transaminase
ARAII	Angiotensin II Receptor Antagonists
AST	Aspartate Aminotransferase
AZT	Zidovudine (INN) or Azidothymidine
BCG	Bacillus Calmette–Guérin
BHIS	Belize Health Information System
BID	Twice a day
BMI	Body Mass index
BP	Blood Pressure
BUN	Blood Urea Nitrogen
CAB	Circulation, Airway and Breathing
CBC	Complete Blood Count
CD4	Cluster of Differentiation 4
CDC	Center for Disease Control and Prevention
CLAP	Latin American Center for Perinatology
CLASP	Collaborative Low-dose Aspirin *Study* in Pregnancy
CM	Congenital Malformation
CMV	**Cytomegalovirus**
CPD	Cephalic Pelvic Disproportion
CRP	C Reactive Protein
CXR	Chest X Ray
DBP	Diastolic Blood Pressure
DHS	Department of Human Services
DIC	Disseminated Intravascular Coagulation
dL	Deciliter
DM	Diabetes Mellitus
DPT	Diphtheria, Pertussis, Tetanus

DT	Diphtheria, Tetanus
DVT	Deep Venous Thrombosis
EDD	Expected Delivery Date
EKG	Electrocardiogram
ELISA	Enzyme-Linked Immunosorbent Assay
ELISA-IFI	Immune enzymatic assay- Indirect immunofluorescence
EMB	Ethambutol
FA	Folic Acid
FBS	Fasting Blood Sugar
FH	Fundal Height
FHR	Fetal Heart Rate
FTI	Free Tyroxine Index
GA	Gestational Age
GABA	Gamma-Aminobutyric Acid
GBS	Group B Streptococcus
GI	Gastro intestinal
GTT	Glucose Tolerance Test
HBIG	Hepatitis B immunoglobulin
HBV	Hepatitis B Virus
HCG	Human Chorionic Gonadotropin
HELLP	DIC
HIV	Human Immunodeficiency Virus
HPV	Human Papilloma Virus
HT	Hypertension
HTN	Hypertension
ICT	Indirect Coombs Test
ICU	Intensive Care Unit
IF	Immune Fluorescence
IFA	Iron and Folic Acid
IHA	Indirect Hemagglutination-
IM	Intramuscular
IMCI	Integrated management of Childhood Illnesses
INH	Isoniazid, isonicotinylhydrazine
IPT	Intermittent Preventive Therapy
IU	International Unit

IUD	Intrauterine Death
IUGR	Intrauterine Growth Restriction
IV	Intravenous
Kg	Kilogram
LAC	Latin America and the Caribbean
LBW	Low Birth weight
LMP	Last Menstrual Period
LTBI	Latent Tuberculosis Infection
M	Meter
MCA	Middle Cerebral Artery
MCV	Mean Corpuscular Volume
mg	Milligram
MH	Micro Hematocrit
MMR	Measles Mumps and Rubella
MO	Medical Officer
MRI	Magnetic Resonance Imaging
MV	Multivitamins
NB	Nota Been
NICU	Neonatal Intensive Care Unit
NPO	Nothing by Mouth
NS	Normal Saline
NST	Non Stress Test
NTD	Neural Tube Defect
NVP	Nevirapine
OBGYN	Obstetrician / Gynecologist
OGTT	Oral Glucose Tolerance Test
OPD	Out Patient Department
OST	O'Sullivan Test
PCP	Primary Care Provider
PCR	Polymerase Chain Reaction
PEF	Peak Expiratory Flow
PHN	Public Health Nurse
PID	Pelvic Inflammatory Disease
PNP	Psychiatric Nurse Practitioner
PO	Per os

PPD	Purified Protein Derivative
PPH	Post Partum Hemorrhage
PRN	When Necessary
PROM	Premature Rupture of Membranes
PSV	Peak Systolic Velocity
PT	Prothrombin Time
PTT	Partial Thromboplastin Time
PV	Per vagina
PZA	Pyrazinamide
Rh	Rhesus
RIF	Rifampicin
RPR	Rapid Plasma Reagin
RPT	Rifapentine
RR	Respiratory Rate
SC	Sub Cutaneous
SCD	Sickle Cell Disease
SGA	Small for Gestational Age
SGOT	Serum Glutamic Oxaloacetic Transaminase
SGPT	Serum Glutamic Pyruvic Transaminase
SP	Sulfadoxine-Pyrimethamine
STAT	Immediately
STI	Sexually Transmitted Infection
TB	Tuberculosis
TSH	Thyroid Stimulating Hormone
TTTS	Twin-Twin Transfusion Syndrome
USG	Ultrasonography
UTI	Urinary Tract Infections
VE	Vaginal Examination
VS	Vital Signs
WD	Women's Department

Preconception care



A. General recommendations

Provide Females in Reproductive Age ***one multivitamin and one folic acid tablet daily****.*

- ✓ All doctors and nurses can provide preconception care to women in reproductive age [15-49 years] at any entry point to the health system

All items with a check mark ✓are actions to be done by health provider

- ✓ Confirm and /or advice on the following when providing care to females in reproductive age (15 to 49 years) irrespective of motive for consultation:
  - — sexual activity and delayed sexual activity
  - — use of contraceptive methods, past and current
  - — planning to get pregnant
  - — folic acid intake to prevent NTD's and vitamin B12 to prevent other congenital malformations
  - — end of last pregnancy
  - — document poor obstetric history
- ✓ Give appointment for preconception consultation to OPD or public health clinic 6 months before getting pregnant.
- ✓ If the woman is not using any contraceptive method and may be at risk of getting pregnant any moment, give preconception counseling and schedule a follow up appointment within 1-2 weeks.
- ✓ Refer to specialist based on identified risk factors/potential complications.
  Assess the family's social risk, and if necessary, refer to social worker.
- ✓ Patients presenting the following conditions are to be prioritized for preconception risk care:
  - <18 years of age and > 35 years
  - Patients living with Diabetes, hypertension, malnourished or having anemia.
  - Asymptomatic bacteriuria
  - Women with cardiomyopathies and asthma
  - Women having risk factors for thromboemboly/itic events
  - Other risks include adverse obstetric history, previous low birth weight products, stillbirths and others.
  - family history of congenital malformations
- ✓ Topics to be discussed in preconception consultation:

Preconception care is defined as a set of interventions aimed at identifying and modifying the risk factors, whenever possible (demographic and medical variables), directly or indirectly related to factors causing malformations or a poor perinatal outcome.

The goal is to provide the couple with all the information required to make informed decisions regarding their reproductive future.

- ✓ Prevention may take place at three different moments:
  - o **Primary prevention** (preconception) to avoid the occurrence of a congenital defect.
  - o **Secondary Prevention** (prenatal care) is to prevent the birth of a defective embryo or fetus.
  - o **Tertiary Prevention** (post-natal) is to prevent the complications originating from congenital defects, improving the newborns' chances of survival and quality of life.
- ✓ **Preconception risk** is the probability of anomalies, due to different risk factors.
  The objectives of preconception risk reduction are to improve sexual and reproductive health in couples to achieve opportune and healthy pregnancies and to enhance the quality of life of mothers and children:
  - — Provide continued and preventive care to women having psycho-bio-social risk factors.
  - — Increase or maintain reproductive health and reduce as much as possible, preventable risks which influence maternal mortality.
  - — Increase capacity for self-care before, during and after pregnancy.
  - — Reduce unnecessary invasive interventions
  - — Reduce perinatal health risks before pregnancy
  - — Reduce preterm birth, restricted intrauterine development, and congenital anomalies.
  - — Increase fetal wellbeing and reduce the causes of asphyxia before delivery
  - — Promote healthy growth and development
  - — Reduce the risk of neurologic morbidity
  - — Promote the development of positive interaction between parents and newborns
- ✓ Reduce the number of unwanted pregnancies
- ✓ Identify and treat behaviors which may lead to poor care during future pregnancies by women, their partners and other family members.
  - ✓ **Risk reduction** is to precede conception by at least 3 to 6 months and includes elimination of habits such as smoking, alcohol consumption and the treatment, compensation or elimination of conditions such as recurring infections, anemia, malnutrition, peripheral vascular insufficiency, endocrinopathies and other chronic processes.

B. Pre pregnancy interventions

1. Nutrition

Table 1 **Body Mass Index and nutritional status pre pregnancy**

Important	Consider	Action
— Any deviation from adequate nutritional status should be rectified before conception by promoting dietary changes and physical activity. — A BMI <18.5 is associated with malnutrition. Before pregnancy it is predictor of Low Birth Weight [LBW] and intrauterine growth retardation [IUGR] — Increased obesity is associated with congenital malformations [6 fold] and preconception diabetes [threefold increase]. — Obesity is a risk factor for chronic non-communicable diseases such as diabetes, hypertension, cancer, hypothyroidism, and lupus that are detrimental to women's health and can lead to fetal death.	BMI Calculation: Weight [Kg]/Height[m]^2 Underweight: BMI<18.5 Normal: BMI 18.5-24.9 Overweight BMI 25.0-29.9 Obesity: BMI ≥30.0	- Women classified as underweight, overweight or obese should delay pregnancy until achieving normal weight. ✓ Counsel on healthy eating habits, exercise, and others to reach BMI 18.5-24.9. ✓ Refer to nutritionist / dietician ✓ Refer pregnant women with BMI >30.0 to OBGYN for management

2. **Micronutrients supplementation**

Table 2 Folic acid and multivitamin supplementation

Important	Action
✓ Hb testing shall be done at least once a year ✓ For women with low Hb [<12mg/dl] test Hb level every 3 months to measure treatment effect FA alone reduces NTD's by 72% FA intake for a year or more before conception reduces spontaneous preterm birth by 70% between weeks 20 and 28, and 50% between weeks 28 and 32. Periconception MV reduces preterm birth before 34th week by 71% and, in non-obese women it reduces the birth of babies who are small for their gestational age by 46%, cerebral tumor [27%] neuroblastoma [47%] and	Counsel on healthy lifestyles [consumption of FA rich diets, and 4 mg of FA –combined with ferrous sulfate- daily plus a MV supplement in order to prevent NTD's and other CM] if the woman has: - poor compliance with medical instructions [FA and/or MV] - low consumption of FA rich foods - consumes teratogenic

Important	Action
leukemia [39%]. Periconception FA and MV reduces NTD's and other CM by 46% [cleft lip and palate, cardiac defects, defects of the limbs and urinary tract and hydrocephalus] Adequate intake of FA reduces the incidence of neural tube defects [NTD's], brain and spinal cord not closed properly [28 days after conception]. Examples of NTD's are spina bifida, encephalocele and anencephaly. Anencephaly is incompatible with life and symptoms associated with spina bifida include infantile paralysis, lack of sphincter control and learning disabilities. Women at high risk for NTD's and other congenital malformations are those with family history of NTD's, those who are taking antiepileptic or methotrexate, those with diabetes, obese women and those with sickle cell anemia or thalassemia.	substances [alcohol, tobacco] When? 3 months before pregnancy up to 3 months after birth, or as long as breastfeeding ✓ In women with higher risk for NTD's [malnutrition - obesity] increase FA to 4-5 mg a day orally along with MV containing Vit B12 ✓ In women with history of NTD's and other CM administer FA 4-5 mg a day plus MV from at least 3 months before pregnancy until 3 months during pregnancy; between 3rd month of pregnancy and for as long as breastfeeding administer 0.4-1 mg of FA plus MV daily PO.

3. Anemia

Table 3 Preventing and treating anemia with iron

Important	Consider	Action
— Iron deficiency anemia in adolescents' girls is associated with an elevated risk of anemia during pregnancy, alterations in cognitive functions and memory, reduced school performance and immunosuppressant with increased infection rates.	Anemia is Hb <12mg/dL [adjust as a function of altitude] Good response to treatment is a rise of 2 g/dL after 2-3 months of iron therapy but treatment should continue for another 3-6 months to replace iron reserves in the bone marrow The best iron supplement is ferrous sulfate.	— Administer MV and elemental iron and FA between meals or at bedtime to avoid alkalizing the food and to take advantage of the high nighttime levels of gastric acidity — Recommend iron rich foods: red meats [liver id the greatest source], eggs [yolks], fish, vegetables [lentils and beans], poultry, raisins and whole grain bread. — Vitamin C [citrus or tomato juice] facilitates iron absorption — Coffee, tea, soft drinks, milk, calcium, magnesium, quinolones, tetracycline and antacids impede absorption. — Refer to OBGYN if there is systemic signs and / or symptoms

Micronutrients and reproductive health in women

- Recommend balanced diets plus multivitamins and iron and folic acid supplements.
- Nutrition imbalances can produce detrimental effects in pregnant women [hypertension, anemia, complications during delivery] and can cause harm to the fetus [congenital malformations, premature delivery, intrauterine growth restriction] and it can affect the composition of the mother's milk.

4. STI's

Table 4 STI's and pre-pregnancy

Important	Consider	Action
— STI's in pregnant women can create severe health problems for both mother and baby. — Women and men suffering STI's Chlamydia and gonorrhea can lead to PID and epididymitis respectively that can also lead to infertility. — HIV because of damage caused to the immune system, this can lead to severe infections and death.	— Manage STI's using syndrome approach, as per STI's guidelines.	Provide treatment for patient and partner Refer to OBGYN complicated STI's cases

5. Antihelminths

- Providing deworming tablets routinely to women in reproductive age reduces anemia and its complications and is associated with lower risk of anemia during pregnancy.
- Administer Albendazole 400 mg orally, single dose, every six months

6. Domestic violence

Table 5 Domestic violence

Important	Tips for Screening for domestic violence:	Actions
Violence against women by their partner or ex-partners is widespread. It can occur in all social groups regardless of economic status, cultural level among others. Difficult to quantify because of underreporting. Abuse rates can go from 20-30%.	**Privacy:** Screen for domestic violence only when you have privacy with the patient, away from other family or friends. **Timing:** As with other sensitive issues, screen for domestic violence only after you have established an initial connection with the patient. **Use of interpreters:** If you are unable to converse fluently in the patient's primary language, use professional interpreters or another health professional as a translator. The patient's family or friends should not be used as interpreters on issues about domestic violence. **Discuss confidentiality and any limits to confidentiality:** Explain objective of filling surveillance form and its use as referral form. **Present screening of domestic violence as routine.** This is something you ask all patients because of the prevalence of the problem.	Screen all females for episodes of violence, determine needs and refer to specialize agencies for services If this is first contact with an institution for this episode of violence, fill

Important	Tips for Screening for domestic violence:	Actions
Violence against women can result in poor health for the mother and the fetus.	**Be calm, and non-judgmental of the patient.** The style of our interview approach often increases or decreases a patient's willingness to disclose. **Gather behavioral descriptions of what happened rather than why it happened or its meaning.** For example, ask if the patient was slapped, pushed, grabbed, threatened or followed, rather than abused or battered. **Use more open-ended questions initially.** Use behavioral examples in the follow-up inquiry. Respectfully use the patients' language and vocabulary to gather information and to convey an understanding of their world. **Listening is one of the most important clinical skills for domestic violence.** It is often a key element in using a culturally appropriate approach. Listening allows the patient to define the problem, which then assists the provider in developing the intervention.	surveillance form Referral can be made to: Police Dept. Haven House Women's Dept. Dept. Human Services Mary's Open Door Legal aid

7. Detecting, preventing and managing alcohol and tobacco consumption

Table 6 Alcohol and tobacco consumption

Important	Consider	Actions
Studies have shown that receptors for the neurotransmitter gamma amino butyric acid [GABA] are involved in the development of alcohol or nicotine dependency; women may present with alcohol related reproductive dysfunctions *[alcohol use negatively affects puberty in females, disrupts normal menstrual cycling and reproductive function, and alters hormonal levels in postmenopausal women]*.	Consumption of alcohol at a very early age is a reliable predictor for high risk sexual behavior, early motherhood and smoking habit.	Screen all females for alcohol and tobacco consumption Counsel on negative effects during pregnancy, and need for discontinuation before becoming pregnant

8. Detecting, preventing and managing depression

Table 7 Depression

Important	Consider	Actions
Depression ranks as the fourth most important disease in young people. With prevalence as high as 8%, strong associations link depression with smoking and suicide in adolescents. There are strong associations among women with anxiety, stress due to major life events [death in	**Signs of depression** include poor school performance, social dysfunctions, and abuse of psychotropic, attempted suicide, poor family relations, and poor use of health services. Depression in adolescents is difficult	Refer to PNP, females identified with signs of

family and divorce], and personal history of depression and lack of support from partner. There is moderate association with lack of social support, domestic violence and unwanted pregnancy.	to predict. Those with minimal symptoms are at low risk; those with moderate or severe symptoms should be monitored and re-assessed –more frequently if pregnancy is a possibility.	depression .

9. Detecting and preventing cervical cancer

Table 8 Cervical cancer

Important	Consider	Actions
Early detection of cervical cancer and HPV vaccination reduces the number of women requiring colposcopy, biopsy, and treatment of precancerous and cancerous cervical lesions. Combining HPV testing with colposcopy produces a sensitivity of 97.2% and raises the specificity to 92.3%	HPV 16 and 18 causes 70% of cases of cervical cancer The minimum age of vaccination is 9 years old Vaccination schedule is based on the manufacturing company recommendations VIA is recommended for females before menopause usually 25 to 49 years.	Screen all women in reproductive age for cervical cancer via VIA or pap smear [see cervical cancer prevention and control clinical guidelines] Promote lifestyles and behaviors to reduce the risk: condom use, reduce the number of partners, and implement strategies for lowering sexual behaviors risk. HPV vaccine is recommended for girls in Standard IV class and 10 year old not in school.

10. Complete immunization series

Table 9 Vaccines

Important	Consider	Actions
Complete vaccination avoids maternal and fetal complications.	If there is 5 doses of DT [in form of DPT, pentavalent, DT] documented, provide additional dose of DT until pregnant If incomplete vaccination, complete DT doses as per vaccination schedule	Review female vaccination card at each encounter Ensure there is no pregnancy and complete vaccines as per national vaccination schedule [DT and MMR] If no documentation available, initiate vaccination with DT and MMR [MMR vaccine is single dose] First dose of DT vaccine at first contact, second dose at 8 weeks after the first dose

11. Detecting and treating periodontal disease

Table 10 Periodontal disease

Important	Actions
Periodontal disease is associated with rheumatic fever, bacterial endocarditis and systemic diseases and, can affect eating and food selection.	Schedule dental checkups twice a year. Recommend regular tooth brushing. Counsel on effects of periodontal disease on increased perinatal morbidity and mortality

12. Preventing pregnancy in adolescents

Table 11 Teen pregnancy

Important	Consider	Actions
— Pregnancy in females below 15 years of age can affect the girl [cesarean section, puerperal infection and intrapartum complications] and the fetus [preterm birth, low birth weight, and neonates who are small for their gestational age].	— Educational interventions from service providers and parents and access to contraceptive methods has proven effective in reducing unwanted pregnancies among adolescents. — Emergency contraception is safe for adolescents	— Counsel on use of male and female contraceptive — Long lasting contraceptive offer better protection for adolescents — Encourage them to seek care with parents, if this is not possible, and they will continue with sexual behavior, provide counseling and contraceptive methods

C. Identification of risk factors that can affect future pregnancy

1. **History:** Couples should be asked about obstetric history, genetic history (hereditary diseases and consanguinity), whether FA is taken at prophylactic doses, habits such as smoking and alcohol consumption,
2. Complete Physical **examination**
3. **Psychosocial history**: social risk factors and lifestyle

   To reduce preconception factors these must be identified early and couples counseled and managed according to the specific risk
4. **Risk Factors for Congenital Defects**
   [a]Age-related

Maternal age:

- Women aged 40 or older account for 2% of all births and 40% of the cases present with Down syndrome.
- Low maternal age (under 20 years of age) is a risk factor for prematurity and for some specific malformations, such as Gastroschisis, and other congenital malformations.

Father's age

- Advanced Father's Age (older than 45 years), raises the risk for new dominant mutations.

[b] Consanguinity Two individuals are consanguineous if they have at least one common ancestor.

[c] Ethnicity Polydactyly, cleft palate and hypospadias is common among African descendants; heart disease in white children; globin disorders, such as Sickle Cell Anemia, more frequent in African

Americans, and Beta Thalassemia, more frequent in persons of Mediterranean origin.

[d] Occupation

Certain Maternal and Paternal work related exposures are associated with increased, adverse perinatal outcomes (abortion, preterm childbirth, low birth weight, congenital defects and fetal death). Some of the many factors include:

- Working more than 10 hours a day.
- Having to stand for more than 6 hours uninterruptedly.
- Exposure to chemicals such as anesthetics, solvents and pesticides.

Life-style

Some habits may determine a series of risks and their identification and modification may benefit women and their future pregnancy.

[e] Nutritional

Preconception evaluation provides a chance to identify poor nutritional status and indicators such as being overweight, having low weight, anorexia, bulimia and an inadequate vitamin supplementation. Malnutrition during pregnancy is associated with prematurity, intrauterine growth retardation (IUGR), perinatal mortality and neural tube defects.

- Reinforce the use of foods rich in folates and carotenoids.
- Spinal and brain congenital malformations occur before the woman knows she is pregnant.
- The recommendations below apply at an individual level before conception:
  - Folic acid/day: 0.4 mg/day, to prevent the occurrence of Neural Tube defects.
  - Women that have already had a child with a NTD and intending to get pregnant must take 10 times that dosage to prevent recurrence: 4 mg of folic acid/day.

[f] Exercise

Pregnancy is associated with a state of hypercoagulability, and together with vascular wall relaxation it predisposes to an increased risk of thrombosis. Exercise should be recommended to diminish the effects of aggravating factors such as prolonged sitting or standing.

[g] Smoking

Some of the deleterious effects attributed to smoking include infertility, spontaneous abortion, restricted fetal growth, risk of prematurity, low birth weight, detachment of the placenta, fetal and perinatal death, and increased risk of respiratory tract infections in the newborn.

[h] Alcohol — No amount is deemed safe during pregnancy. Alcohol consumption is associated with intrauterine death (IUD), restriction of pre- and postnatal growth, low birth weight, disorders of the central nervous system and behaviour. Excessive consumption of alcohol early in pregnancy may cause Fetal Alcohol Syndrome in about 10% of pregnancies.

[l] Drugs — *Generally,* all drugs have a negative effect on pregnancy. The use of cocaine during pregnancy has been linked to defects of the central nervous system, limb reductions and Restricted Intrauterine Growth (IUGR). Marihuana has similar effects as those associated with cigarette smoking during pregnancy.

[j] Tea, mate & soft drinks, these stimulants should be consumed moderately. High consumption during the first trimester of pregnancy has been associated with spontaneous abortion and high consumption during later stages of pregnancy may cause low birth weight.

[k] Family — Dynamics within the family may pose a social risk which has been linked to adverse perinatal outcomes.

[l] Family history — Some congenital malformations have strong genetic causes or environmental causes which affect the family.

Genetics

[m] Personal history — High parity (four or more pregnancies) doubles the risk of fetal death during delivery and is associated with maternal morbidity-mortality. *This is a non-modifiable risk factor; women must be warned about this, helping them decide whether a new pregnancy is adequate. If they choose to get pregnant again, special caution must be taken during the prenatal period and especially at delivery and postpartum.*

Non Transmissible Chronic Diseases in the Mother. Affect 5% of the population of women in child-bearing age. The outcomes to which they predispose depend both on the physiopathology changes they effect and the side effects of medications used for their treatment.

[n] Diabetes.

Important	Consider	Actions
Advise diabetic women, to obtain an optimum glycemic level; failing to do so may result in an increased risk of adverse embryofoetal and maternal outcomes. The teratogen effect of uncontrolled Diabetes during the first trimester of pregnancy results in embryopathy, causing malformations such as heart disease, and caudate dysgenesia and spontaneous abortions. Later in pregnancy, it causes diabetic fetopathy, expressed as neonatal hypoglycemia and macrosomy. Evaluation by OBGYN/Internist is required.	WRA with Diabetes, need to control their Diabetes before becoming pregnant	Investigate plans for becoming pregnant. If satisfied parity, ensure access to definite contraceptive method. If desire to become pregnant, counsel on the maternal and fetal complications.

Increased risk of obstetric complications: Hypertensive disorders during pregnancy – DMII Thromboembolism rates are higher. *Premature labour:* babies are 5 times more likely to be delivered before 37 weeks. *Spontaneous abortion* rates are higher *Obstructed labour:* macrosomic (BW ≥4,000 g); 8% of babies had shoulder dystocia. *Polyhydramnios* *Maternal infection* *Caesarean section*		Develop a plan on how to achieve glycemic control. HbA1c test, its best if the level is no more than 6.1% before pregnancy.

[o] **Epilepsy** It affects 1 of 300 women of child-bearing age and is the most frequent neurologic disorder during pregnancy. The risk of congenital defects is 1 in 15. The course of the condition during pregnancy remains unchanged, in half the cases may improve in 5% of pregnant women or worsen in 45%. Carbamazepine is the drug of choice as monotherapy during pregnancy because some anticonvulsants, such as diphenylhydantoine, increase the risk of NTD's, interfering with the metabolism of folates.
Repeated episodes of generalized or complex partial tonic-clonic seizures are associated with spontaneous abortions, fetal hypoxia, bradycardia and perinatal death, apart from the risk of having a premature delivery and IUGR as a result of poor therapeutic management.

[p] Hypertension Blood pressure should be optimized before pregnancy and during gestation; alpha methyldopa is the drug of choice in the chronic hypertensive woman. Angiotensin Converting Enzyme Inhibitors (ACEIs) and Angiotensin II Receptor Antagonists (ARAII) are contraindicated during pregnancy because of their deleterious effects on the fetus' kidneys.
Systemic hypertension is associated with IUGR, low birth weight, prematurity and high perinatal mortality. Fetal risk is at its maximum when proteinuria is present.

[q] Heart disease The use of oral anticoagulants during pregnancy is contraindicated because of their teratogenic effect.

[r] Anemia Iron-deficient anemia is usually the most frequent (95% of all anemias) and is associated with placenta previa, hypertrophy and abruption placenta, pre-eclampsia and post-partum hemorrhage. If it is severe, it may lead to IUGR and increased neonatal mortality. ***Use Neonatal IMCI for identification and management of severe anemia.***

Medications used and procedures carried out in women having some chronic non-communicable diseases. Medication must be avoided unless indispensable. A thorough evaluation of fetal risk vs. maternal benefit is required whenever a drug is prescribed.

[s] Isotretinoine Vitamin A and some of its derivatives have a long and proven teratogenic action in animals. Isotretinoine (to treat cystic acne) and Etretinate (to treat psoriasis), are highly teratogenic; therefore, women should be warned to postpone pregnancy until

at least a year after the drug is discontinued. Retinoid related defects at birth are essentially craniofacial, cardiovascular, of the central nervous system and thymus. Cognitive delays has also been observed in half the number of children that survive beyond 5 years; one third of this group fails to present any defects at birth.

[t] Thalidomide The teratogenic effect of this drug is extensively proven, causing atypical disorders with focomelia [undeveloped limbs and absent pelvic bones]. It is used in the treatment of leprosy and HIV. Any woman taking talidomide should discontinue its use before becoming pregnant.

[u] Coumarinic The use of coumarinic anticoagulants is basically restricted to women with prosthetic heart valves or with a history of deep venous thrombosis. Their teratogenic effect is expressed as nasal cartilage hypoplasia, optic atrophy, epiphysis punctate (warfarin-induced embryopathy); as such, they should be replaced with low molecular weight heparins.

[v] Misoprostol It has been related to congenital malformations - vascular disruption. The most significant are facial palsy, lateral gaze palsy, hydrocephalus and heart disease.

[w] Radiation The intense proliferation, differentiation and cell migration typical of embryonic and fetal development are associated with high radio susceptibility. However, the radiation dose used in most diagnostic medical procedures (0.01 to 1600 rads) is much lower than the 5 rad limit exposure considered safe during pregnancy. At times, a misperception of the teratogenic risk may lead to unnecessary interruptions of pregnancy. This is not justified in mothers exposed to low-dose ionizing radiation.

Transmissible maternal diseases. Most infectious diseases listed below interfere with embryonic development and beyond, sometimes acting after birth. The primary target is to prevent its occurrence during gestation, and if it does occur, the fetus or the newborn (if the benefit is greater than risk) must be treated. Vaccination records and personal history need to be checked to identify and vaccinate susceptible women.

[w] Rubella and Varicella Serological testing is warranted in women of child-bearing age who are susceptible. Congenital rubella syndrome in the newborn comprises cardiac, cerebral, ophthalmic and auditory defects. It may also cause prematurity, low birth weight, and neonatal thrombocytopenia, anemia and hepatitis. The risk of major defects or organogenesis is highest for infection in the first trimester.

Varicella infection during the first 28 weeks of gestation, can lead to fetal varicella syndrome (also known as *congenital varicella syndrome*). Effects on the fetus can range in severity from underdeveloped toes and fingers to severe anal and bladder malformation.

[x] Cytomegalovirus (CMV) is the most frequent congenital infection, leading to neurosensorial deafness and viral-related cognitive delays. This

infection occurs in 1% of births (80% are asymptomatic).
Adult, infected immune-suppressed patients may develop severe consequences.
All women, but especially mothers with young children and those in close contact with children through their profession (school teachers, health care) must be warned of the importance of cleanliness (hand-washing) when handling diapers impregnated with the urine of young children which is typically the main source of infection.

[y] Toxoplasmosis All women, regardless of their serological status, should receive general advice on how to prevent toxoplasmosis. Pregnant women should avoid handling raw meat, drinking raw milk (especially goat milk) and be advised to not eat raw or undercooked meat regardless of type. Because of the obvious relationship between Toxoplasma and cats it is also often advised to avoid exposure to cat feces, and refrain from gardening (cat feces are common in garden soil) or at least wear gloves when so engaged.

[z] Syphilis Women with syphilis must be informed about the risks of vertical transmission of this sexually transmitted infection and treatment is a must to protect the newborn from being infected.

[aa] HIV Counsel Women of child-bearing age to get HIV screening tests done on an annual basis. Women with positive tests must be informed about the risk of vertical transmission and the prophylactic/treatment available. Adherence to treatment should be encouraged.

[a] Hepatitis B All the antibody-negative population, and especially adolescents and women of child-bearing age should be vaccinated against hepatitis B. Being a dead-virus vaccine it may be administered even during pregnancy. Fetal hepatitis B infection is associated with prematurity and small-for gestational-age children.

[ac] Flu The anti-influenza vaccine is manufactured with non-infective, inactivated viruses, so it can be safely administered during pregnancy.

5. Mental health disorders

Table 12 Mental health and pregnancy

Important	Consider	Action
— **Depression and anxiety** are approximately twice as prevalent in women as in men, highest rates are during childbearing years, from puberty to menopause. — Studies of depression and anxiety show incidence of approximately 5% in non-pregnant women, 8-10% during pregnancy and highest (13%) in the year post delivery. — Suicide is one of the most common causes of maternal death in the year following delivery in developed countries. — Psychosis, rare and occurs in only 1 to 2 women / 1000 giving birth. May be higher in less developed countries, where infection may contribute to its occurrence. — Prolonged or severe mental illness hampers the mother-infant attachment, breastfeeding and infant care. The Infants show less sociability with strangers, fewer facial expressions, smile less, cry more, and are more irritable than infants of normal mothers. — They do not perform well on thinking and intelligence tests at 18 months of age especially boy babies' speech development; they are more distractible, less playful and less social up to age 5. — In older children may include neglect, abuse and slower social, emotional and cognitive development, including higher rates of school and behavior problems. — Effects on marital relationships [disruption and/or spousal abuse by either partner].	Introductory statements to initiate the conversation: **Prenatal Visit:** • I'd like to check with you to hear about how you are feeling since you've become pregnant. • Since you are now in the third trimester of your pregnancy and getting closer to your delivery, I'd like to check with you and hear about how you are feeling lately. **Postpartum Visit:** • Now that you have had your baby, I would like to know how you are feeling and how you have been coping lately.	Screen pregnant women and women in postpartum period for depression Apply the Edinburgh Postnatal Depression Scale If referral needed: I would like you to speak with someone more about your feelings. This referral will help you take care of your health and your baby's health.

Pregnancy

Low risk and high risk pregnancy

Table 13 Low risk and high risk pregnancy

Screening	**Risk Factors**		
Thorough review of medical history, physical findings, lab evaluations, and ultrasound report, and determine whether the pregnancy is at low or high risk for complications. **High risk pregnancy** is when the mother has a medical condition that could affect the pregnancy or there are signs of a potential fetal complication.	**Maternal conditions** Diabetes, Hypertension, Asthma, Seizure disorder, Thyroid condition, Heart conditions, Blood clotting abnormalities, HIV infection, Sickle cell and severe anemia, Cancers, Other medical and autoimmune diseases e.g. systemic lupus erythematosus, kidney failure, psychosis.	**Fetal conditions** Usually detected after the pregnancy has progressed to a certain point or else they are suspected based on the outcome of a previous pregnancy. Congenital defects e.g. spina bifida or heart malformation, Rh incompatibility, Intrauterine infection, Fetal growth problems (restriction), twins or triplets, will classify the pregnancy as high risk even though nothing is inherently wrong with the fetuses.	**Obstetric Problems** Problems that may classify the pregnancy as high risk: Placenta previa, Premature labor, PROM, Uterine fibroids (some), Congenital or acquired abnormalities of the maternal genital tract, Cervical incompetence (include history of LEEP or conization), Conditions such as teenage pregnancy, advanced maternal age and grand multiparity [relative increased risk]. They require special attention although not necessarily considered high risk.
Low risk pregnancy	Consider low risk Pregnancies those that do not contain any of the enumerated risk factors; if doubt exists regarding the risk status during pregnancy, referral is advised for review by specialist.		
Follow up	Low risk pregnancy As per pre-established protocols, and provided by primary care level providers – Initial diagnosis up to 29 weeks: monthly visits – 30 – 35 weeks: every other week – 36 – 40 weeks: weekly checks		High risk pregnancy As recommended by treating specialist.
Laboratory investigations	CBC, FBS, HIV and RPR at first contact and at 32 weeks GA, blood typing, sickle cell, dipstick urine test at each prenatal check, urinalysis as per protocol, O'Sullivan test and similar others, at least one ultrasound examination (18 - 20 weeks GA)		

Low risk pregnancy

A pregnancy is considered low risk when the mother has no medical conditions that can affect the pregnancy or when there are no signs of a potential complication in the fetus.

Screen for HIGH RISK at each encounter

- ✓ Medical officer or nurse having first contact with pregnant women must complete the CLAP form **and** enter information into the BHIS.
- ✓ Review Medical History to classify the pregnancy as low or high risk pregnancy, document on classifying form and monitor accordingly.
- ✓ Clients who meet the following LOW RISK criteria are managed as normal pregnancies:
  - — Age 18 years to 39 years.
  - — History of One to four pregnancies.
  - — Adequate family support.
  - — Pregnancy is planned: previous pregnancy end date up to LMP for this pregnancy is greater than 2 years.
  - — Normal Obstetric History: no history of stillbirths, abortions, neonatal deaths, low birth weight, macrosomic fetus or multiple births.
  - — Normal basal metabolic index (monitor weight and height).
  - — No Family or Personal Medical history of risk factors (including infertility and violence).
  - — No Surgical History (C- Section, Genito- urinary surgery).
  - — No History of transmissible maternal disease past or present (HIV, Toxoplasmosis, Hepatitis B, Syphilis).
  - — No consumption of alcohol and/or drugs.
  - — Have Normal Laboratory blood values: (CBC, FBS, HIV,RPRL, blood typing, sickle cell, dipstick urine test at each prenatal visit, urinalysis as per protocol)
- ✓ Low risk pregnancies are to be followed up at regular clinics by Midwife, Public Health Nurse or Medical Officer as per routine visits:
  - — Initial diagnosis – 29 weeks: monthly visits
  - — 30 – 35 weeks: bi- weekly visits
  - — 36 – 40 weeks: weekly visits
- ✓ MO, PHN, RHN should assess for high risk conditions at each prenatal visit and **refer** high risk patients as per protocol to most experienced Medical Officer and/ or Obstetrician.
- ✓ MO and Nurses to provide health education to pregnant women at each prenatal encounter (group session in waiting area and individualized counseling in the consultation room).

A pregnancy is considered high risk when the mother has a medical condition that could affect the pregnancy or when there are signs of a potential complication in the fetus.

High Risk Pregnancy

- ✓ MO's and OBGYN's to assess and manage patients as per protocol, based on findings from medical records, physical examinations, laboratory evaluations and ultrasound reports.
- ✓ MO's and Nurses to ensure immediate referral of emergency obstetric cases to Obstetrician.

  This protocol describes the steps that need to be taken at Primary Health Care facilities for selected conditions, before referral for specialized care.
- ✓ Emergency obstetric conditions will require **immediate** referral **after stabilizing** the patient.

  Obstetric services can be found at Polyclinics and Regional Hospitals, some Community Hospitals have access to visiting Obstetricians.
- ✓ All staff needs to be aware of the conditions constituting high risk pregnancies and the basic steps for their immediate care and management.
- ✓ PHN and RHN to review at every encounter the presence of High Risk Maternal and Fetal conditions, based on signs and symptoms, laboratory and ultrasound results and data from the perinatal clinical simplified card (CLAP Form).
- ✓ CLAP Form and BHIS must be updated by doctors and nurses at each encounter.
- ✓ Frequency of visits and specific follow up (management) for high risk pregnancies will be determined by treating specialist. The Specialist will determine if the pregnant woman can continue management at a primary care facility, detailed plan to be followed at primary care level and appointment to OBGYN Clinic.
- ✓ The PHN will coordinate the outreach (home visits) follow up of non-compliant high risk clients [abnormal laboratory results, non-compliance with treatment, recommendations, referrals] and advocate for family support.

D. Fetal Health

Fetal health Decalogue [*Source: Castilla y col, 1996, (modified).*

1. Even without knowing it, any woman of child-bearing age may be pregnant.
2. The ideal reproductive age for women is 25 to 34 years
3. Prenatal controls are the best guarantee for healthy pregnancies.
4. It is important for all women of child-bearing age to be vaccinated against rubella.
5. Drug consumption should be avoided or reduced to the absolutely indispensable.
6. Alcohol is harmful during pregnancy.
7. Pregnant women should not smoke, and they should avoid second hand smoking.
8. Eat a variety of foods, including fruits and vegetables.
9. Pregnant women should seek advice if their occupation poses a risk.
10. In case of any doubts, seek the care of the health team.
11. The recommended time between pregnancies is 3 years, minimum 2 years

✓ **Fetal wellbeing** is assessed to predict possible fetal risk, need for specialized care, minimize fetal lesions when present, avoid the need for interventions and prolong pregnancy past the stage of prematurity.

Indications Tests of fetal wellbeing allow clinicians to determine the fetus current status and early identification of risk factors that can lead to negative outcomes and are indicated when the following risks and conditions are present during pregnancy:

- Previous fetal loss, Rh sensitization, reduction of fetal movements, pregnancy and hypertension, pregnancy and DM, oligo or polyhydramnios, IUGR, Post-term, pregnancy, bleeding and hemorrhage during the second half of pregnancy, premature rupture of membranes, risk of or preterm labour.
- Other individual conditions, such as fetal anomalies
- Ultrasonography for nonmedical, recreational uses such as determination of fetal gender are not recommended.

Classification of methods (tests)

Clinical

- Clinical auscultation of fetal heart rate
- Evaluation of maternal weight gain curve
- Measurement of the uterine height
- Fetal movement count

Fetal profile

- Sonographic evaluation of fetal growth, presentation, placental position and anatomic survey. Fetal anatomy is assessed adequately by ultrasonography after approximately 16-20 weeks of gestation.
- Fetal biometry – monitoring of fetal movements, tone, respiration, heart rate and measurement of amniotic fluid via ultrasound
- Monitoring of the fetal heart rate (Non-stress and stress test) for fetal heart rate, movements and uterine contraction

Doppler ultrasound

- Detection of malformations

Biochemical

- Alfa feto protein -Increased values in congenital anomalies, intrauterine growth restriction and -eclampsia

Management Fetal wellbeing is usually assessed when there are risks or other conditions present, therefore ensure that tests are indicated and completed when referral is made to OBGYN's; the non-completion of indicated test should not cause unnecessary delay of referral.

Table 14 Assessing fetal well being

Criteria	2	0
Fetal movements	3 or more movements (body and extremities)	≤ 2 movements in 30 minutes
Respiratory movements	2 or more episodes of acceleration of 15 beats per minute with 15 seconds for up to 30 minutes, corresponding with fetal movements	No fetal movements, respiratory movements 0 or less than 1 in < 30 seconds /30'
Fetal tone	1 or more flexion and extension of trunk and extremities	Slow extension and partial flexing. only movements in extremities (extensions)
Amniotic Fluid Index	Normal value: AFI 8-25	- AFI of < 8 implies oligohydramnios - AFI of > 25 implies polyhydramnios
Fetal Heart Rate	≥ 2 episodes of acceleration 15 bpm, 15'' duration in 30', coinciding with fetal movements	≤ 2 accelerations of 15 bpm < 15 '' duration

✓ Biophysical profile and decision for intervention

- Punctuation of 10 can be found in normal fetus, low risk for chronic asphyxia.
- Punctuation of 8 with Olygohydramnios, interrupt pregnancy if greater than 36 weeks gestation.
- Punctuation of 6 is indicative of chronic asphyxia. Follow up every 24 hours. IF there is Olygohydramnios or punctuation persists, interrupt pregnancy.
- Punctuation of 4: Indicative of chronic asphyxia. If fetal maturation is positive, interrupt pregnancy. No fetal maturation, indicate pulmonary maturation and repeat in 24 hours. If 4-6 punctuation persists, interrupt pregnancy.
- Punctuation of 2 in less than 60 minutes, evident chronic asphyxia. Consider interrupting the pregnancy irrespective of gestational age.

✓ Counting of fetal movements. Factors affecting fetal count:

a. Maternal activity and attention
b. Speed on intensity of movements
c. Placental location
d. High dose depressants
e. Descent of presenting part
f. Congenital anomaly

g. Fetal movement increased with the increase of gestational age
h. The amniotic fluid index can interfere with perception of fetal movements
i. Other factors

✓ Start the use of Kick chart at 34 weeks

Table 15 Fetal growth anomalies

Risk Factors for Fetal growth anomalies		
Maternal	**Fetal**	**Neonatal**
— Anemia — Preeclampsia — Placental accidents, previa, abruptio — Polyhydramnios — Hemorrhage due to uterine atonia, PPH — Cesarean delivery	— Malformations — IUGR — Intrapartum Acute Fetal Distress — Abnormal presentations — Premature rupture of membranes — Umbilical cord prolapsed	— Preterm — Small for gestational Age [SGA] — Neonatal depression at minutes 1 and 5

Intrauterine Growth Restriction (IUGR) and Macrosomia

✓ At each prenatal care visit, assess fetal growth by assessing gestational age, fundal height, maternal weight, ultrasound- fetal biometry.

✓ Analyze fetal growth utilizing : fundal height vs gestational age, weight gain vs gestational age

✓ Determine fetal growth status: intrauterine growth restriction, macrosomia

Diagnosis

— History of risk factors or conditions associated with IUGR (see table below)
— Clinical evidence - Intrauterine growth (size) less than expected for gestational age [lower than percentile 10]
— Ultrasonographic assessment of fetal size

Management

— Refer to OBGYN for management

Neonates with IUGR frequently suffer from birth defects, hypoglycemia, hypocalcemia, polycythemia and cold stress, learning disorders, physiological and metabolic disruptions that may not become evident until adulthood, i.e., diabetes, obesity, hypertension and coronary artery disease.

Fetal macrosomia

Diagnosis

- History of risk factors or conditions associated with Macrosomia
- Clinical evidence - for gestational age, above percentile 90, while fetal macrosomia implies growth a specific weight, usually 4000 - 4500 grams, regardless of the gestational age.
- Ultrasonographic measurement of the fetus

✓ Definitive diagnosis upon birth

There is a higher frequency of instrumented childbirth, shoulder dystocia, acute intradelivery fetal distress, neonatal depression and neurological sequelae -impaired coping skills adapting to extrauterine life (hyaline membrane disease, transient respiratory distress, hypoglycemia), increased risk of depressed 5-minute Apgar score.

Table 16 Factors associated with fetal growth anomalies

Factors most frequently associated with IUGR	Factors more frequently associated with fetal macrosomia
— IUGR in an earlier pregnancy — Smoking habit — Alcohol consumption — Drug consumption — Insufficient maternal weight at the start of pregnancy — Insufficient weight gain during pregnancy — Existing hypertension or pregnancy-induced hypertension — Thrombophilia syndromes — Multiple pregnancy — Maternal anemia — Intrauterine infections — Placenta previa — Diabetes with vascular disease — Congenital defects.	— Macrosomia at an earlier pregnancy. — Non-vascular maternal diabetes. — Rh isoimmunization. — Obese mother with an excessive weight gain during pregnancy.

E. Booking—First Prenatal Care

Definition: first contact with the health system

✓ Confirm pregnancy

- Pregnancy Rapid test or
- Refer to laboratory for testing

Table 17 Clinical Signs of Pregnancy

Probability Signs	Certainty – Positive signs
— Amenorrhea — Changes in the uterus — Detection of HCG	— Detection of the HCG beta subunit — Detection of fetal parts — Fetal heart beats — Blood and urine assessment — Abdominal palpation — Obstetric stethoscope, — Doppler or ultrasound — Ultrasound

✓ Doctor or Nurse should book client once pregnancy has been confirmed

✓ Complete CLAP Form (Doctor or Nurse):

- pregnant women identification and economic status
- Socio-educational Status
- Family History
- Personal History
- Obstetric History
- establish date of amenorrhea
- Determine gestational age and expected Date of delivery using gestogram
- Ask about smoking, drugs and violence
- Determine antitetanus vaccination status
- If fully vaccinated, does not need a any other vaccine
- If the patient is a primigravida will require two doses with at least 4 weeks within intervals
- Determine MMR vaccination status of pregnant mother
- measure weight and height
- Calculate BMI
- determine client's current HIV status
- If client has 14 weeks or more initiate prophylactic treatment as per protocol
- Test for Syphilis and treat as per result
- if positive initiate treatment as per protocol (algorithm on pg 73)
- treat any other sexually transmitted infections using the syndrome approach

✓ Doctor or nurse conduct complete physical examination

✓ Check Blood pressure, if elevated refer to MO for evaluation

- ✓ Assess fundal height and document on CLAP form and graph fundal height/GA
- ✓ Assess fetal wellbeing (fetal heart rate and fetal movements)
- ✓ Order blood works - Hb level, CBC, FBS, HIV rapid test, RPR, sickle cell, grouping
- ✓ Do urine dipstick, If positive for proteinuria, or UTI [leucocytes and nitrites must be present] ketones, or glucose refer to MO for treatment.
- ✓ Provide Health Education :
    - — Family Planning
    - — STIs
    - — Breastfeeding
    - — donation of blood
    - — Importance of bringing urine for urinalysis to every prenatal visit
    - — Nutrition
    - — hygiene
    - — Danger signs and symptoms
    - — on any other personal need during assessment
- ✓ Determine if this is a low or high risk pregnancy.
- ✓ If a low risk pregnancy, give appointment following recommendation as per gestational age.
- ✓ If a high risk pregnancy, depending on the risk, schedule closer appointments or refer to OBGYN for further assessment

F. Pelvic Assessment

Purpose. Before birth, the size of the fetal head can only be estimated clinically in an approximate manner by evaluating the fundal height, fetal size and the ratio between the fetal head and the upper inlet plane. The type of pelvis and its diameters may be assessed through the vaginal exam.

- ✓ Conduct pelvic assessment at the 37th week gestation by the Medical Officer. Pelvic assessment can be determined by:
    - — Palpating both ischial spines simultaneously may suggest potential CPD
        - o Refer to OBGYN
    - — Difficulty in palpating both ischial spines simultaneously (too distant) may suggest adequate pelvis for vaginal delivery (without malpresentations).
- ✓ Other findings (Refer to OB/Gyn)
    - — Vaginal septa (transverse, stenotic).
    - — Other soft birth canal obstacles (tumor, large cysts, vaginal narrowing)

G. Weight gain during pregnancy

- ✓ Check for pre-pregnancy weight documented in BHIS/medical record
- ✓ Document maternal weight at every antenatal visit
- ✓ Determine if first weight is normal, overweight or underweight
- ✓ When the pregravidic weight is known or can be reliably estimated:
    - Counsel and provide health education based on findings

- ✓ **Plot maternal weight on weight gain graph and interpret findings:**

Normal findings: Initial weight and weight gain will be considered normal if at a certain GA, the weight reached by the mother is between 10 percentile and 90 percentile.

Diagnosis : Good nutritional status

Management: follow usual prenatal schedule

- ✓ Encourage healthy eating and weight maintenance

Abnormal findings

Weight below 10 percentile

Management

- ✓ Investigate nutritional history, pregnancy-related hyperemesis, infections, parasites, anemia, and diseases.
- ✓ Treat underlying conditions when present and provide nutritional counseling through more frequent appointments
- ✓ Provide Incaparina during pregnancy and postnatal period up to 6 months postpartum

Expected minimum weight gain is 8 kg.

Weight above percentile 90

Management

- ✓ determine causes: diabetes, obesity, edema, polyhydramnios, macrosomy, multiple pregnancy,
- ✓ treat underlying conditions when present and provide nutritional counseling through more frequent

Weight gain = 16 kg during entire pregnancy

Management

- ✓ if it persists, refer woman to high-risk clinic
- ✓ Refer to high-risk clinic: polyhydramnios, macrosomy, or multiple pregnancy,

When the weight is not known

Many pregnant women do not know their usual weight before pregnancy. In these cases, an average weight gain of 400 g a week in the second trimester and 300 g a week in the third trimester is acceptable.

When the pregravidic weight is not known and woman seeks care late during the pregnancy, Tables showing weight for height ratio by gestational age indicate if the gain obtained until then is adequate for gestational age by uterine height.

Management

- ✓ For abnormal findings, investigate underlying causes, refer when needed and counsel on appropriate nutrition.

Table 18 Weight gain during pregnancy

Weight gain recommended by Weight category	Women's pregestational BMI (kg/m^2)	Total weight gain in **pounds** over entire pregnancy	2nd and 3rd trimester average pounds/week	Over entire pregnancy in multiple pregnancies [pounds]
Low weight	< 18.5	28-40	1	
Normal weight	18.5 – 24.9	25-35	1	37-45
Overweight	25.0 – 29.9	15-25	0.6	31-50
Obese [all categories]	30.0 or more	11-20	0.5	25-42

H. Multiple Pregnancies

Suspicion

— Maternal or personal history of multiple pregnancies.

— Stimulation therapy before the current pregnancy.

Presumptive diagnosis

— Larger than expected for gestational age.

— Height greater than p 90 of the fundal height for gestational age curve.

— Palpation of several fetal parts.

— Palpation of more than two fetal poles.

— Palpation of two equal fetal poles (two crowns or two rumps)

— Palpation of two different fetal poles, too close to or too far from each other, suggesting they do not belong to the same fetus.

— Palpation of more than one source of fetal beats with different frequencies.

Certainty Diagnosis

— Palpation of two fetuses in the ultrasound.

— Palpation of two asynchrony heart rate recordings simultaneously.

Management

Women carrying more than one baby are at increased risk of complications in pregnancy, which can affect the health of both mother and babies. '

- ✓ Refer to OBGYN, a means of improving health outcomes for women and their infants.
- ✓ Schedule appointments based on OBGYN recommendations [Every two weeks during 2nd trimester and weekly during 3rd trimester]
- ✓ Monitor for signs of preterm labor starting at 20 weeks gestation [VE or USG to determine shortening of the cervix].
- ✓ Beyond 20 weeks gestation advise to reduce activities and to rest several times a day
- ✓ During the third trimester, recommend tests of fetal well-being [**non-stress test**, and **biophysical profile**, which combines the non-stress test with an ultrasound]
- ✓ Stress the availability of one unit of blood by 32 weeks gestation, and multivitamins containing iron tablets intake to prevent anemia [common in multiple gestation]
- ✓ Advice on alert and danger signs
- ✓ Follow other protocols e.g. UTI, anemia, etc.

Notes

1. Incidence 1.5-2% of total births
2. Iron-deficiency anemia is common in multiple gestations, and it can increase the risk of premature birth.
3. Mean gestational age at delivery is about 3 weeks shorter and the mean birth weight value is 1000 g lower in multiple pregnancies.
4. Women from low socio economic populations, approximately half the multiple pregnancies end up as preterm childbirths (less than 37 weeks); more than half that reach full term suffer from IUGR;
5. Severe asphyxia the first and fifth minute of life is respectively three and four times higher than in singleton deliveries.
6. Women carrying more than one baby are at increased risk of complications in pregnancy, which can affect the health of both mother and babies. '

Who is most likely to have multiples?

- Women with Fertility treatment
- Age over 30 years
- A personal or family history of fraternal (non-identical) twins
- Obesity or taller-than-average height (2, 5)
- African-American race (African-American women are more likely to have fraternal twins than Caucasian women, and Asian women are the least likely to have fraternal twins) (5)

Conditions associated with multiple pregnancies

Premature birth About 60 percent of twins, more than 90 percent of triplets, and virtually all quadruplets and higher-order multiples are born premature (1). The length of pregnancy decreases with each additional baby. On average, most singleton pregnancies last 39 weeks; for twins, 35 weeks; for triplets, 32 weeks; and for quadruplets, 29 weeks (1).

Low birth weight (LBW) More than half of twins and almost all higher-order multiples are born with low birth weight (less than 5½ pounds or 2,500 grams) (1). LBW can result from premature birth and/or poor fetal growth. Both are common in multiple pregnancies.

Twin-twin transfusion syndrome (TTTS) About 10 percent of identical twins who share a placenta develop this complication (6, 7).

Preeclampsia Women expecting twins are more than twice as likely as women with a singleton pregnancy to develop this complication, characterized by high blood pressure, protein in the urine and generalized swelling (edema) (9

Gestational diabetes Women carrying multiples are at increased risk of this pregnancy-related form of diabetes (high blood sugar) (9). This condition can cause the baby to grow especially large, increasing the risk of injuries to mother and baby during vaginal birth. Babies born to women with gestational diabetes also may have breathing and other problems during the newborn period.

I. Rh negative mothers

A. **Sensitized women – first affected pregnancies**

- Critical titer: -D titer value of 1:8 or 1:16 is associated with the risk for fetal hydrops
- In the first affected pregnancy, serial maternal antibody titers are determined every 4 weeks until 24 weeks of gestation, then every 2 weeks until delivery, as long as the titer remains below the critical titer.
- If the critical titer is present or exceeded, perform middle cerebral artery-peak systolic velocity [MCA-PSV]

- MCA-PSV above 1.5 multiples of the median is predictive of severe anemia.

B. Sensitized women –previously affected fetus/infant

- After the first affected pregnancy there is a greater severity of fetal/neonatal hemolytic disease
- If the patient has had a prior significantly affected pregnancy (e.g., fetal hydrops, intrauterine fetal transfusion, preterm delivery because of fetal anemia, neonatal exchange transfusion), then severe fetal anemia in subsequent pregnancies is almost certain.
- The severity of fetal anemia is assessed beginning at 18 weeks of gestation (maternal antibodies predictive value is low)

✓ Indicate

Early Ultra Sound [at first contact]

- To establish the correct gestational age (important in interpreting laboratory values)
- Essential for guiding invasive procedures
- Essential in monitoring fetal growth and well-being
- Detects fetal hydrops (hydrops not observed until the fetal hemoglobin deficit is at least 7 g/dL below the mean for gestational age)
- Every 1-2 weeks perform MCA-PSV (best method for determining the severity of fetal anemia

Amniocentesis

- In case of previous, seriously affected fetus or infant
- Determines amniotic fluid bilirubin levels (indirectly estimates the severity of fetal).
- The remaining management of the second (or more) affected pregnancy is similar to first affected fetus.

C. Antepartum management

✓ Indirect Coombs Test (ICT) at **first contact** for each pregnancy.

✓ Second ICT at 28 weeks gestation.

✓ Administer Anti-D immune globulin (Rhogam) to Rh (D)-negative woman whose fetus is or may be RH(D) positive and has:

- Spontaneous or induced abortion
- Ectopic pregnancy
- Multifetal reduction
- Invasive procedures: amniocentesis; chorion villus sampling; fetal blood sampling
- Threatened abortion (significant clinical bleeding, not just spotting
- Fetal death in the second or third trimester
- Blunt trauma to the abdomen (including motor vehicles)
- Antepartum hemorrhage in the second or third trimester (e.g. placenta previa or abruption)
- External cephalic version

— Hydatidiform mole

Non-sensitized Rh negative women at 28 weeks gestation

- ✓ 250 IU (50mcg) or standard 300 mcg at 12 weeks gestation (small volume of red cells in the feto-placental circulation)
- ✓ Antepartum hemorrhage after 20 weeks gestation or pregnancies complicated by fetal death or blunt abdominal trauma, 300 mcg Rhogam should be given in association with testing for feto-maternal hemorrhage. Additional Rhogam if excessive bleeding is detected.

Post-partum management

- ✓ Determine newborn's blood group and Rh
- ✓ Rhogam within 72 hours of birth if newborn is Rh(D)-positive.
- ✓ If Rhogam is inadvertently omitted after delivery, administer as soon as possible after recognition of the omission. *Partial protection is afforded with administration within 13 days of the birth*
- ✓ A delivery that occurs less than three weeks after the administration of anti-D immune globulin, for the usual indications, does not require a repeat dose unless a large feto-maternal hemorrhage is detected in the immediate postpartum period.
- ✓ Administer Rhogam to Rh negative mother even if she decides to have her tubes tied (Reasons: sterilization reversed later; failure in 1% cases). Treatment prevents her from developing antibodies in case she ever needs a blood transfusion. Presence of antibodies makes matching blood types for transfusion harder.

J. Ultrasonography in Obstetric practice

Ultrasonography is a non-invasive, diagnostic method which reflects differences in tissue density. Allts application is based on the existing relationship between amenorrhea, the anatomic development of the fetus and the measurement of certain segments of the fetus. Although it may be indicated anytime during pregnancy, the earlier it is performed, the higher the precision; furthermore, as measurements can be repeated with a certain periodicity, estimation errors can be considerably reduced.

Routine obstetric ultrasound should only be at 18–20 weeks' gestation when the EDD is more reliable. Other obstetric USG should be justified by treating physician.

Table 19 Indications before or after the routine obstetric USG

First trimester: (trans-abdominal, trans-vaginal)	**Second and third trimester**
Gestational age + Presence of foreign bodies (IUD's) + Diagnosis of multiple pregnancies + Suspicion of fetal death + Ectopic pregnancies + Molar pregnancies + Abortion (in different stages) + Sonographic markers + Evaluation of the cervix and placental insertion + Diagnosis of severe structural malformations + Diagnosis of uterine or ovarian tumors concomitant with pregnancy	Evaluation of fetal wellbeing + Suspicion of fetal death + Diagnosis of multiple pregnancies + Diagnosis of fetal malformations + Evaluation for markers of chromosome abnormalities + Determination of sex + Location of appropriate site for amniocentesis or chordocenthesis + Evaluation of amniotic fluid + Evaluation of fetal growth + Evaluation of cervix + Evaluation of placental insertion and maturity [location, attachment and maturity of the placenta]

Other Obstetric ultrasound indications

Indications during puerperium

Evaluate for product retention, evaluation of post-operatory patients, diagnosis of adnexal masses or liquid/blood in abdominal cavity, contribute to the diagnosis of endometritis

Maternal Indications

- Renal characteristics (hypertension or suspicion of urolithiasis), hepatic characteristics (liver and gall bladder) and other medical indications.
- Foetal biometry may be used to estimate the gestational age before 26 weeks of gestation; thereafter, its greatest utility is in the study of fetal growth.
- When there is not a reliable gestational age, by date of LMP, the GA is estimated based on measures which best correlate with amenorrhea:
  - During the 1st trimester using the maximum cephalo-caudal length (+/- 5-7 days)
  - The biparietal diameter during the 2nd trimester (+/- 8 days during wk 18)
  - Length of the femur (+/- 2 weeks during the 2nd and 3rd trimesters).
- The most reliable results are obtained using a combination of measures. However, the measures must correlate for their inclusion in the estimate of GA and special attention must be taken when discordant measures are obtained.
- Other measures which may be of use in helping to estimate the GA include:
  - Placenta: Grade I (beginning 31 weeks); grade II (36 weeks) and grade III (initiating 38 weeks)
  - Amniotic fluid index: to determine olygo or hyperdydramnios
  - Intestinal maturation

Other measures

- Kidneys visible at 18 weeks.
- Pericraneal and subcutaneous adipose tissue in the foetus of 2-3mm after 30 weeks of GA
- Distal femoral epiphysis appears at 32-33 weeks,
- Proximal tibia epiphysis appears at 35-36 weeks and
- Proximal humeral epiphysis appears at 37-38 weeks.
- Biometric estimates of GA are inferred by fetal size, are influenced by biological variability of fetal size and by measurement errors, reason why they are less reliable as gestational age progresses.

✓ If GA by date of conception is reliable, changes in its estimate should not be base on ultrasonography findings.

✓ If date of last menstruation is not reliable, the ultrasonography should be carried out as early as possible.

- ✓ As of week 12 and up to week 20, the GA estimate should be obtained based on the 4 parameters previously discussed and if not possible, at least based on craneal circumference and femoral length.
- ✓ If GA is calculated during early pregnancy, changes should not be made to the estimated GA based on later ultrasonography measures.

K. Vaccines

- — Infectious disease agents may cause complications to the embryo or fetus if they cross the placental barrier. Maternal antibodies grant passive immunity during pregnancy, protecting the embryo and fetus from developing anomalies.
- — Request and review documentation of previously received vaccines
- — Encourage pregnant women to safeguard on vaccines received to avoid re-vaccinations
- — Some vaccines may be administered during pregnancy but others need to have well defined indications for use during pregnancy:

Table 20 Vaccines and pregnancy

Vaccination	Type of vaccine	Recommendation on administration during pregnancy	Optimal period of administration
Measles	Live attenuated	Not recommended	Before pregnancy
Parotiditis	Live attenuated	Not recommended	Before pregnancy
Poliomyelitis	Live attenuated	Not recommended	Before pregnancy
Rubella	Live attenuated	Not recommended	Before pregnancy
Yellow Fever	Live attenuated	May be administered if imminent/inevitable risk of exposure	
Hepatitis B	Inactivated live virus	May be administered based on individual cases	Before pregnancy
Influenza	Inactivated live virus	May be administered based on individual cases	Before pregnancy
Rabies	Inactivated live virus	May be administered based on individual cases	
Cholera	Inactivated bacterial	Not recommended unless imminent/inevitable risk of exposure	
Typhoid fever	Inactivated bacterial	Not recommended if no imminent/inevitable risk of exposure	
Tetanus	Toxoid	See below	See below
Hepatitis B	Immunoglobulins	May be administered if needed	
Rabies	Immunoglobulins	May be administered as post exposure prophylaxis.	
Measles	Immunoglobulins	Not for mothers exposed during pregnancy	
Hepatitis A	Immunoglobulin G	May be administered as post exposure prophylaxis	

Antitetanic vaccination to prevent neonatal and puerperal tetanus:

- Upon first contact, a woman will be asked whether she has received the tetanus toxoid and the number of DT containing vaccines received will be documented: PT/HepB/Hib, DPT, DT.
- Management will be determined by number of vaccines received. See the scheme below.

Table 21 Tetanus toxoid vaccine scheme - administration in pregnant women

Immune status	First dose	Second dose	First reactivation
a) 0 doses received	22	26	
b) Only1st dose received -		26*	
c) 2nd dose received -		26**	
d) 2nd dose received -	-		+1 at 26***

*The interval between the administration of the 1st and 2nd dose of tetanus toxoid is of at least 27 days and no more than 181 days.
** As long as the minimal interval between the second dose and the reactivation is of 5 months.
*** No reactivation unless more than 10 years since last reactivation received. To be administered during week 26 of gestation. Total of five documented DT containing vaccines, requires a DT booster every 10 years

Measles, Mumps and Rubella vaccine

✓ If no MMR vaccine received is documented, provide MMR vaccine after delivery

Seasonal Influenza Vaccine

Seasonal Influenza vaccine is considered safe to use during pregnancy. It can be given to pregnant women who have a risk factor for complications of influenza, or who will be in the 2nd or 3rd trimester during the influenza season [November to April]

Other vaccines

✓ See Expanded Program on Immunization Manual for more details on vaccines during pregnancy

L. Sexual intercourse during pregnancy

✓ Provide counseling on sexual intercourse during pregnancy to couples.

Sexual intercourse during the last six weeks prior to delivery does not pose any risk for women with normal pregnancy

Sexual intercourse during the last six weeks of pregnancy is risky for women with: Multiple pregnancy, valuable product, threatened abortion or preterm delivery, placenta previa, among others.

There is no evidence on sexual intercourse as a cause of preterm delivery, rupture of membranes, bleeding or infection.

- ✓ Suspend sexual intercourse (including masturbation) during first trimester of pregnancy, only in case of women with history of consecutive abortions,
- ✓ Alert on signs of infection.

In nulipara, sexual intercourse in third trimester may cause cervical injury and bleeding

- ✓ Orgasm during the third trimester of pregnancy and the presence of prostaglandins in semen, can initiate labour pain, recommend the use of condom and no sexual intercourse after 34 weeks of pregnancy

Libido during first and second trimester varies from woman to woman.

In third trimester of pregnancy, usually the libido decreases as women may perceive themselves as being non attractive.

- ✓ Sexually transmitted infections and other vaginal infections can cause preterm delivery and/or premature rupture of membranes. Identification and treatment (syndrome management) is encouraged. See Manual on Sexually Transmitted Infections.
- ✓ Counsel couple on the risk of maternal and fetal infections secondary to anal sex.

M. Dental Care and Pregnancy

- ✓ A comprehensive oral and dental examination should be included in the clinical assessment of all pregnant women to confirm or rule out the presence of dental caries, also to detect the existence of periodontal disease and lesions in mouth and tongue.
- ✓ Periodontal disease includes both gingivitis and periodontitis. Dental disease is one of the most frequent chronic infectious processes, its prevalence ranging from 10% to 60%, depending on the population's socio-sanitary conditions.
- ✓ **Gingivitis** is an inflammatory condition of the soft tissues surrounding the teeth and gums.
- ✓ **Periodontitis** involves the destruction of the teeth support structures, such as the periodontal ligament, the bone, cement and the soft tissues.

Table 22 Risk factors, symptoms and management dental care and pregnancy

Risk factors	Symptoms	Management
Smoking Hormonal changes Diabetes Other diseases(Cancer or AIDS) Genetic susceptibility	Bad breath that won't go away Red or swollen gums, tender or bleeding gums Painful chewing Loose teeth Sensitive teeth Receding gums	Obtain medical history to identify underlying conditions. Examine gums and look for signs of inflammation. Encourage daily cleaning of teeth with fluoride toothpaste. Use antimicrobial mouth rinse Encourage good nutrition to keep oral cavity healthy and strong. Refer patients with abnormal findings to dentist, for further assessment and treatment.

N. Violence

- ✓ Screen all pregnant women for gender based violence (intimate partner is the most common) by asking the following questions [Positive response to any question denotes abuse]:

  1. Have you ever been emotionally or physically abused by your partner or someone important to you?
  2. Within the last year, have you been hit, slapped, kicked, or otherwise physically hurt by someone? If yes, by whom? How many times?
  3. Since you have been pregnant, have you been hit, slapped, kicked, or otherwise physically hurt by someone? If yes, by whom? How many times and where?
  4. In the last year, has anyone forced you to have sexual activities? If so, whom? How many times?
  5. Are you afraid of your partner or anyone you listed above?

- ✓ Counsel and refer based on needs:
  - A&E: wounds, crisis, PEP, collections of forensic evidence (coordinated WD or DHS, who will coordinate with Police Department)
  - PNP: psychological support / treatment
  - Police Department: statement, restraining order assessment
  - Legal aid agencies
  - Women's Department: cases in adults, male and female
  - Department of Human Services : cases in children
  - Haven House and Mary Open Door: shelter program
- ✓ Fill gender based violence form COMPLETELY if this is the first contact for this episode.
- ✓ Assess and plan for patient safety; in cases of security issues, report STAT to WD or DHS.
- ✓ Report all violence cases in adults to the Women's Department [male and female]

Sexual Violence

- ✓ Follow sexual violence protocol
- ✓ Sexual violence in children must be reported to the Department of Human Services.
- ✓ Sexual violence in adults must be reported to the Women's Department [male and female]
- ✓ Both WD and DHS will conduct investigation and determine reporting to the Police Department
- ✓ Recollect forensic evidence utilizing Forensic Unit documentation and collection tools

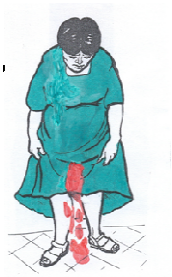
Health consequences

Intimate partner and sexual violence have serious short- and long-term physical, mental, sexual and reproductive health problems for survivors and for their children, and lead to high social and economic costs.

- ✓ Health effects can include headaches, back pain, abdominal pain, fibromyalgia, gastrointestinal disorders, limited mobility and poor overall health. In some cases, both fatal and non-fatal injuries can result.
- ✓ Intimate partner violence and sexual violence can lead to unintended pregnancies, induced abortions, gynecological problems, and sexually transmitted infections, including HIV. Intimate partner violence in pregnancy also increases the likelihood of miscarriage, stillbirth, pre-term delivery and low birth weight babies.
- ✓ These forms of violence can lead to depression, post-traumatic stress disorder, sleep difficulties, eating disorders, and emotional distress and suicide attempts.
- ✓ Sexual violence, particularly during childhood, can lead to increased smoking, drug and alcohol misuse, and risky sexual behaviors in later life. It is also associated with perpetration of violence (for males) and being a victim of violence (for females).
- ✓ Violence against women has immediate and long term consequences and manifests in diverse forms
    - Psychological or emotional – constant insults, humiliation, destruction of cherished possessions, purposeful disregard, threats, abandonment, intimidation, criticism, accusations, blame, denial of basic needs.
    - Physical – use of physical strength or use of weapons to inflict harm.
    - Sexual violence – Includes forced unwanted pregnancies.
    - Violence against women who are pregnant has many consequences and includes: spontaneous abortion, laceration of the cervix, vagina or perineal area, uterine rupture, abrupt placentae, premature rupture of membranes, chorioamnionitis, maternal/fetal death, congenital infections, post-partum psychosis.
    - Other types of violence: economical,

Illnesses during pregnancy

A.



Bleeding

Broken Water Bag

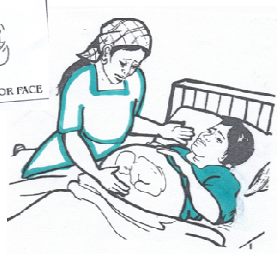
Do you have any of these danger signs?

Go NOW to the nearest Hospital or Health Center

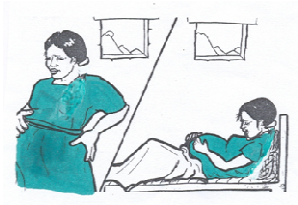
Other Danger Signs

Blurred Vision (seeing stars)
Headache
Swelling in the foot
Swelling in the whole body
Vomiting
Shortness of Breath
Infection in the kidney
Paleness, Anemia (poor of blood)

Fever or feeling sick after Baby is born



Baby is not coming head first



Severe belly bottom pain or back pain

Heavy bleeding after Baby is born

Ministry of Health Belize, in collaboration with the Pan American Health Organization

A. Urinary tract infections during pregnancy

Steps before referring to OBGYN				
Screen and diagnosis	Treatment and follow up 3 days after, change if necessary	Dipstick the following day after completing treatment	No improvement, request urine culture	Refer to OBGYN for further evaluation and management

1.1. **Definitions.**

—A urinary tract infection (UTI) is an infection of the urinary tract (bladder, kidneys) due to the presence of bacteria in the urine (bacteriuria).

- **Asymptomatic Bacteriuria (ASB) / UTI Asymptomatic**: when bacteria growth is >100,000 colony forming units (cfu)/mL present in urine (midstream, clean catch) culture in the Absence of UTI symptoms. The ASB is only considered clinically important during pregnancy.

- **UTI Symptomatic:** when bacteria growth is > 100,000 cfu /mL present in urine (midstream) culture in presence of symptoms.

  - ***Cystitis*** (bladder infections) is typically accompanied by painful urination (dysuria), urgency and frequent urination, lower abdominal pain or suprapubic.

  - ***Pyelonephritis***, a more severe infection of one of both kidneys, is often accompanied by fever, chills, nausea, vomiting, and flank pain, often in addition to symptoms of cystitis.[1,2]

Table 23 **Urinary Tract Infections (UTI) Diagnosis and Treatment**[1,2,3]

Disease	Diagnosis	Treatment
Asymptomatic Bacteriuria (ASB)	Screen for UTI using urine dipstick at each antenatal control: Nitrite and/ or leucocytes esterase positive OR ONE >100,000 cfu/mL urine culture*at 12-16 weeks of gestation.	1. Nitrofurantoin 100 mg Oral 2 time a day with meals 7 days. **OR** 2. Cephalexin 500 mg oral 2-3 times a day x 7 days **OR** 3. Cephadroxil 500 mg oral 2 times a day x 7 days
Symptomatic UTI		
Cystitis (bladder infection)	Dysuria, urgency and frequent urination, lower abdominal pain or suprapubic plus Nitrite and/or leukocytes esterase positive in dipstick.	1. Nitrofurantoin 100 mg Oral 2 time a day with meals x 10 days. **OR** 2. Cephalexin 500 mg oral 2-3 times a day x 10 days **OR** 3. Cephadroxil 500 mg oral 2 times a day x 10 days
Persistent Asymptomatic or symptomatic bacteriuria or recurrent UTI (3 UTI in last 12months or 2 UTI's in last 6 months)	Nitrite and/or Leukocytes esterase positive in Dipstick **OR** >100,000 cfu /mL at Urine culture after treatment.	1. Nitrofurantoin 100 mg 4 times/day **OR** 2. Cephalexin 1 g every 6-8hours **OR** 3. Cephadroxil 1 g 2 times/day, for 10-14 days, 4. Followed by prophylaxis for the rest of the pregnancy: - Nitrofurantoin 100 mg **OR** - Cephalexin 125mg **OR** - Cephaclor 250 mg, at bedtime
Pyelonephritis	Fever, chills, nausea, vomiting, and loin tenderness, in addition to cystitis symptoms Plus Nitrite and leukocytes esterase positive in urine dipstick OR ONE >100,000 cfu /mL in urine culture.	1. Urine culture [before starting treatment] 2. Cephtriaxone 1 g every 24 h or every 8-12 h in severe infections -IM or IV en 5 minutes for 10-14 days. 3. Treatment resistance [no clinical response in 72 hours] change to gentamycin at 3-5 mg/kg/day IV every 8 hours, (or gentamycin 5 mg/Kg/day every 24 hours) x 10 days plus ampicillin 1-2 g IV every 6 hours for 10-14 days. 4. After two days afebrile, change to PO high dose cephalosporin as mentioned in persistent asymptomatic bacteriuria for 14 days.

Follow up

- Asymptomatic UTI and UTI with Mild symptoms

✓ Repeat dipstick the day after completing treatment (8th day after initiating treatment).
✓ If leukocytes and nitrites positive in dipstick or symptoms persist, request urine culture.
✓ Consider change of antibiotics
✓ Screening with dipstick at each prenatal visit
✓ Advise on the need for immediate attention if severe symptoms persist or occur
✓ Monitor and alert for symptoms and signs of preterm labor.

- UTI with severe symptoms

✓ Once the two weeks treatment is successfully completed, initiate prophylaxis to avoid recurrence with Nitrofurantoin 100mg PO daily x 30 days.
✓ Conduct health education
— Increase liquid intake
— Proper wiping techniques (front to back)
— Condom use

B. Hypertensive disorders during pregnancy

2. Document family and personal history and markers for high risk for pre-eclampsia
3. Consider gestational age: <20 weeks GA or > 20 weeks GA
4. How to diagnose Hypertension: Outpatient or inpatient systolic BP ≥ 140 mmHg and/or diastolic BP ≥ 90 mmHg, based on the average of *at least* 2 measurements, taken at least **15 minutes apart,** using the same arm.
5. Look for signs of severe complications
6. Classify the type of hypertension based on definitions within below table
7. Indicate laboratory tests as per trimester of pregnancy
8. MO's to initiate treatment for severe pre-eclampsia or eclampsia and stabilization of the patient before referral, and consult management with OBGYN
9. OBGYN to develop treatment plan and follow up
10. Severe preeclampsia require hospitalization
11. If BP of severe pre-eclampsia cannot be controlled or eclampsia presents, refer to hospital with capacity for emergency cesarean section, consider the need for admission to ICU to reduce delay to national hospital
12. Severe features of preeclampsia:
    - Hypertension: systolic >160 or diastolic >110 on two occasions at least 4 hours apart while the patient is on bed rest (unless antihypertensive

therapy is initiated before this time)

- Thrombocytopenia (platelet count <100,000).
- Impaired liver function (elevated blood levels of liver transaminases to twice the normal concentration), severe persistent RUQ or epigastric pain unresponsive to medication and not accounted for by alternative diagnoses, or both.
- New development of renal insufficiency (elevated serum creatinine greater than 1.1 mg/dL, or doubling of serum creatinine in the absence of other renal disease).
- Pulmonary edema.
- New-onset cerebral or visual disturbances.

Referral and hypertensive disorders during pregnancy

Steps before referring to OBGYN			
Screen and diagnosis	Monitor for elevated BP	Counsel patient and relatives on alert and danger signs	Refer to OBGYN for further evaluation and management: severe pre-eclampsia and eclampsia

Table 24 Treat severe pre-eclampsia and eclampsia with Magnesium sulfate

Loading dose	*Maintenance dose is 1gr magnesium sulfate / hour*	If convulsions reoccur
4 gr magnesium sulfate in 250 ml D_5W IV administered in 20 minutes	i. *using infusion pump, administer solution of 12 (twelve) gr of magnesium sulfate in 500 cc DW given over 12 hours* ***OR*** ii. ***If no infusion pump is available,*** follow immediately with 10 g of 50% magnesium sulphate solution, 5 g in each buttock as deep IM injection, with 1 ml of 2% lignocaine in the same syringe. iii. Continue with 5 gr $MgSO_4$ (50% solution) together with 1 ml lignocaine 2% in the same syringe every 4 hours into alternate buttocks.	Give 2g magnesium sulphate (50% solution) IV over 15 minutes.
Continue the treatment with magnesium sulphate for 24 hours after delivery or the last convulsion, whichever occurs last.		

Table 25 **Follow up when treating severe pre-eclampsia and eclampsia**

Monitoring during use of $MgSO_4$	**Complications**	**Antidote**
Every four (4) hours i. Respiratory rate ii. Patellar reflexes (knee jerk) iii. Urinary output	**Repeat doses of magnesium sulphate must be withheld or delayed if:** i. The respiratory rate is less than 16 per minute ii. Patellar reflexes are absent iii. Urinary output is less than 30 ml per hour over preceding 4 hours In cases of diuresis less than 30ml/hour and central venous pressure less than 13 cm H20, administer 300 ml Hartman solution and monitor response. In case of persistent diuresis below 30ml/hour and central venous pressure greater than 13 cm H20, administer furosemide 20 mg IV repeated one hour after not obtaining and adequate diuresis.	i. Give calcium gluconate 1g (10 ml of 10% solution) IV slowly until respiration is satisfactory ii. Assist ventilation using bag and mask, anesthetic apparatus or intubation

Table 26 Hypertensive disorders during pregnancy

Classification	[a] Pre-existing (chronic) hypertension, with comorbid condition(s) or with evidence of preeclampsia	
	[b] Gestational hypertension, with comorbid condition(s) or with evidence of preeclampsia	
	[c] Preeclampsia	
	[d] Other hypertensive effects: Transient hypertensive effect, White-coat hypertensive effect, Masked hypertensive effect	
Markers for increased risk for preeclampsia	Demographic and family history	Maternal age ≥ 40 years; Family history of preeclampsia (mother or sister); Family history of early-onset cardiovascular disease
	Past medical or obstetric history	Previous preeclampsia; Anti-phospholipid antibody syndrome; Pre-existing medical condition(s); Pre-existing hypertension or booking diastolic BP ≥ 90 mmHg; Pre-existing renal disease or booking proteinuria; Pre-existing diabetes mellitus; Lower maternal birth weight and/or preterm delivery; Heritable thrombophilia [factor V Leiden gene mutation and protein S deficiency]; Increased pre-pregnancy triglycerides; Non-smoking; Cocaine and methamphetamine use; Previous miscarriage at ≤ 10 weeks with same partner

Markers for increased risk for preeclampsia	Current pregnancy: First trimester	Overweight/obesity; First ongoing pregnancy; New partner; Short duration of sexual relationship with current partner; Reproductive technologies[1]; Inter-pregnancy interval ≥ 10 years; Booking sBP ≥ 130 mmHg, or booking dBP ≥ 80 mmHg; Vaginal bleeding in early pregnancy; Gestational trophoblastic disease; Abnormal PAPP-A or free βhCG
Markers for increased risk for preeclampsia	Current pregnancy: second or third trimester	Elevated BP (gestational hypertension); Abnormal AFP, hCG, inhA, or E3[2]; Excessive weight gain in pregnancy; Infection during pregnancy (e.g., UTI, periodontal disease); Abnormal uterine artery Doppler[3]; IUGR; Investigational laboratory markers[4]
	Other non-specific risk factors for severe complications of preeclampsia	Young maternal age, nulliparity, lower maternal weight, and in the index pregnancy, multiple pregnancy and early-onset preeclampsia.13
Preventing preclampsia	Women at low risk	Start preventative interventions before 16 weeks 'gestation when most of the physiologic transformation of uterine spiral arteries occurs [the greatest potential to decrease early forms of preeclampsia].[37] Calcium supplementation of at least 1 g/d, orally, is recommended for women with low dietary intake of calcium (< 600 mg/d). Abstain from alcohol for prevention of fetal alcohol effects, exercise for maintenance of fitness, periconception use of a folate-containing multivitamin for prevention of neural tube defects, and smoking cessation for prevention of low birth weight and preterm birth. Periconception and ongoing use of a folate containing multivitamin or exercise may be useful in preventing preeclampsia.
	Women at Increased Risk	Low-dose acetylsalicylic acid (75–162 mg/d), **administered at bedtime,** after diagnosis of pregnancy but before 16 weeks' gestation, and considered for continuation until delivery. Calcium supplementation (of at least 1 g/d) for women with low calcium intake. The following may be useful: L-arginine, increased rest at home in the third trimester, and reduction of workload or

[1] Subfertility and its treatment (especially the use of donor eggs, sperm and/or gametes), after correction for multiple gestations.

[2] Decreased first trimester PAPP-A ≤ 5th centile, 110 decreased first or second trimester placental growth factor, unexplained increased second trimester AFP, increased second trimester hCG, increased first or second trimester inhA, increased second trimester activin.

[3] Abnormal uterine artery Doppler velocimetry is practically defined at 22 to 24 weeks as bilateral notching with mean resistance index (RI) > 0.55 (i.e., > 50th centile), unilateral notching with mean RI > 0.65 (> 90th centile), or no notching with mean RI > 0.70 (> 95th centile).

[4] Investigational markers include, in the first trimester: PAPP-A, PlGF, PP-13, and in the second trimester: elevated sFlt-1/PlGF (soluble fms-like tyrosine kinase, placental growth factor), PAI-1/PAI-2 (plasminogen activator inhibitor) von Willebrand factor, and leptin.

		stress. The following may be useful for prevention of other pregnancy complications: prostaglandin precursors, magnesium supplementation, and heparin to prevent venous thromboembolic disease. Others: abstention from alcohol, periconception use of a folate-containing multivitamin, and smoking cessation.

Table 27 General recommendations – HT during pregnancy

Counseling	Counsel women with preexisting hypertension, before they become pregnant	
Medicines / drugs	Can be used during pregnancy	Acceptable for use in the first trimester of pregnancy: methyldopa, labetalol, and nifedipine. Planned changes in antihypertensive agent(s) for care in pregnancy should be made while the woman is planning pregnancy if the woman has uncomplicated pre-existing hypertension, or, if in the presence of comorbid conditions, she is likely to conceive easily (within 12 months). Magnesium sulphate is recommended for first-line treatment of eclampsia. MgSo4 is recommended as prophylaxis against eclampsia in women with severe preeclampsia. MgSo4 may be considered as prophylaxis against eclampsia in women with non-severe preeclampsia but with severe hypertension, headaches/visual symptoms, right upper quadrant/epigastric pain, platelet count < 100 000 × 109/L, progressive renal insufficiency, and/or elevated liver enzymes, based on cost considerations. MgSO4 should be used in standard dosing, usually 4 g intravenous loading dose followed by 1 g/hour. Routine monitoring of serum magnesium levels is not recommended. In women with pre-existing or gestational hypertension, MgSO4 should be considered for fetal neuroprotection in the setting of imminent preterm birth (within the next 24 hours) at ≤ 31+6 weeks. Delivery should not be delayed in order to administer antenatal MgSO4 for fetal neuroprotection if there are maternal and/or fetal indications of emergency delivery.
	NOT to be USED during pregnancy	Phenytoin and benzodiazepines should not be used for eclampsia prophylaxis or treatment, unless there is a contraindication to MgSO4 or it is ineffective. Angiotensin-converting enzyme inhibitors and angiotensin receptor blockers should be discontinued when planning pregnancy or as soon as pregnancy is diagnosed. Atenolol should be discontinued when pregnancy is diagnosed.

Plasma volume expansion	Not recommended for women with preeclampsia.	
Prevention of preeclampsia	Calcium: may be useful in populations with low calcium intake. Low-dose aspirin (60 to 80 mg): beginning in the late first trimester may have slight effect to reduce preeclampsia and adverse perinatal outcomes.	— Antioxidants: vitamins C and E are not effective. — Bed rest or salt restriction: no evidence of benefit.
Classifications of Hypertension[5]		
Resistant hypertension	If there is need for 3 antihypertensive medications for BP control at ≥ 20 weeks' gestation.	
Transient hypertensive effect	Defined as outpatient systolic BP ≥ 140 mmHg or a diastolic BP ≥ 90 mmHg that is not confirmed after rest, on repeat measurement, on the same or on subsequent visits. Elevated BP may be due to environmental stimuli, e.g., the pain of labour.	
White-coat hypertensive effect	BP that is elevated in the clinic (e.g. systolic ≥ 140 mmHg or diastolic ≥ 90 mmHg), but < 135 mmHg (systolic) and < 85 mmHg (diastolic) on ambulatory or home BP monitoring.	
Masked hypertensive effect	BP that is normal in the clinic (e.g., systolic< 140 mmHg and diastolic < 90 mmHg) but elevated on ambulatory or home BP monitoring (e.g., systolic ≥ 135 mmHg or diastolic ≥ 85 mmHg).	
Severe hypertension	Defined, in any setting, as a systolic BP of ≥ 160 mmHg or a diastolic BP of ≥ 110 mmHg based on the average of *at least* 2 measurements, taken at least 15 minutes apart, using the same arm.	
Laboratory works	Urine testing Urinalysis [dipstick] to determine proteinuria [without RBCs or casts] Oxygen saturation Pulse oximetry [SpO2 <97% associated with heightened risk of severe complications [including non-respiratory] Hemoglobin [↑ due to intravascular volume depletion; ↓ if microangiopathic hemolysis (with HELLP)] CBC and blood film	

[5] The term PIH (pregnancy-induced hypertension) should be abandoned, as its meaning in clinical practice is unclear.

	Platelet count [↓ associated with adverse maternal outcome] Blood film [RBC fragmentation] Test of coagulation INR international normalized ratio and aPTT (activated partial thromboplastin time) [↑ with DIC, which is usually associated with placental abruption; ↑is associated with adverse maternal outcome Fibrinogen [↔ ↓] Serum chemistry Serum creatinine [↑ due to hemoconcentration and/or renal failure; ↑ associated with adverse maternal outcome] Serum uric acid [↑ associated with adverse maternal outcome] Glucose [↔] AST or ALT [↑ associated with adverse maternal outcome] LDH [↑ may be prominent; the ↑ is associated with adverse maternal outcome] Billirubin [↑ unconjugated from hemolysis or conjugated from liver dysfunction] Albumin [↓ associated with adverse maternal and perinatal outcomes]
Severe features of preeclampsia	Hypertension: systolic >160 or diastolic >110 on two occasions at least 4 hours apart while the patient is on bed rest (unless antihypertensive therapy is initiated before this time) — Thrombocytopenia (platelet count <100,000). — Impaired liver function (elevated blood levels of liver transaminases to twice the normal concentration), severe persistent RUQ or epigastric pain unresponsive to medication and not accounted for by alternative diagnoses, or both. — New development of renal insufficiency (elevated serum creatinine greater than 1.1 mg/dL, or doubling of serum creatinine in the absence of other renal disease). — Pulmonary edema. — New-onset cerebral or visual disturbances.
Fetal testing	Uterine artery Doppler velocimetry [Unilateral/bilateral notching, or elevated pulsatility index or resistance index may support a diagnosis of placental insufficiency including preeclampsia] Fetal monitoring [Abnormal or atypical FHR tracing (e.g., decreased variability)] Deepest amniotic fluid pocket [Oligohydramnios associated with adverse perinatal outcomes] Ultrasonographic assessment of fetal growth [Usually intrauterine fetal growth restriction (typically asymmetrical but can be symmetrical if early and/or severe)]

	Umbilical artery Doppler [Increased resistance, absent or reversed end-diastolic flow] Ductus venosus [Doppler Increased resistance, especially absent or reverse A wave] Middle cerebral artery Doppler [Cerebral redistribution (decreased resistance or "brain-sparing effect"). May be lost in extreme cases prior to fetal death]
Proteinuria	— Defined as the excretion of >300mg of protein in a 24-hour urine collection. Alternatively, a timed excretion that is extrapolated to this 24-hour urine value, or a *protein/creatinine ratio* of at least 0.3 (each measured as mg/dL). The *dipstick method* is discouraged for diagnostic use unless other approaches are not readily available. 1+ is considered as the cutoff for the diagnosis of proteinuria. — The diagnosis of severe preeclampsia is no longer dependent on the presence of proteinuria. Do not delay management of preeclampsia in the absence of proteinuria. — Massive proteinuria (> 5 g) has been eliminated from consideration of preeclampsia as severe. — Fetal growth restriction has been removed as a finding indicative of severe preeclampsia.
Comorbid conditions	(e.g., pre-gestational type I or II diabetes mellitus or kidney disease) warrant tighter BP control outside of pregnancy because of their association with heightened cardiovascular risk.
With evidence of preeclampsia	Also known as superimposed preeclampsia, defined by the development of one or more of the following at ≥ 20 weeks: — resistant hypertension, *or* — new or worsening proteinuria, *or* — one or more adverse conditions,* *or* — one or more severe complications.* Severe preeclampsia is defined as preeclampsia with one or more severe complications.
Comorbid conditions (e.g., pre-gestational type I or II diabetes mellitus or kidney disease)	Bed rest in hospital (vs. unrestricted activity at home) may be useful to decrease severe hypertension and preterm birth. Warrant tighter BP control outside of pregnancy because of their association with heightened cardiovascular risk.
With evidence of preeclampsia	May appear only many weeks after the onset of gestational hypertension. Preeclampsia is defined as gestational hypertension with one or more of the following: — new proteinuria, *or* one or more adverse conditions,* *or*

	— one or more severe complications.* Severe preeclampsia is defined as preeclampsia with one or more severe complications.
	Nifedipine short acting capsules, parenteral hydralazine or parenteral labetalol Nifedipine and MgSO4 can be used simultaneously Alternative antihypertensive medications include a nitroglycerin infusion, oral methyldopa, oral labetalol, oral clonidine or postpartum oral captopril Treat refractory hypertension with sodium nitroprusside MgSO4 solely is not recommended as an antihypertensive agent Continuous fetal heart rate monitoring is advised until BP is stable
	The choice of antihypertensive is based on patient characteristics, contraindications to a particular drug, and physician and patient preference: - Angiotensin-converting enzyme inhibitors[6] and angiotensin receptor blockers[7] should not be used during pregnancy. - Atenolol and prazosin are not recommended prior to delivery.
	Captopril, enalapril, or quinapril may be used postpartum, even during breastfeeding.
Corticosteroid therapy:	Administer antenatal corticosteroids for women delivered by elective Caesarean delivery at ≤ 38+6 weeks' gestation to reduce respiratory morbidity.[8] Administer antenatal corticosteroid therapy to women who present with preeclampsia at ≤ 34+6 weeks' gestation [despite the absence of proteinuria or adverse conditions], only if delivery is contemplated within the next 7days. Administer a rescue dose of corticosteroids for women at ≤ 34+6 weeks' gestation who remain at high risk of preterm delivery 7 days or more after an initial course of antenatal corticosteroids. (Maximum two courses].
Women with Preeclampsia	Delivery is the only intervention that initiates resolution of preeclampsia, and women with gestational hypertension or pre-existing hypertension may develop preeclampsia. All women with severe preeclampsia should be delivered immediately (either vaginally or by Caesarean), regardless of gestational age. For women with non-severe preeclampsia at < 24+0 weeks' gestation, counselling should include, as an option, information about delivery within days. For women with non-severe preeclampsia at 24+0 to 33+6 weeks' gestation, expectant management should be only at KHMH.

[6] Benazepril (Lotensin), captopril (Capoten), enalapril (Vasotec, Epaned), fosinopril (Monopril), lisinopril (Prinivil, Zestril) moexipril (Univasc), and perindopril (Aceon), quinapril (Accupril), ramipril (Altace), trandolapril (Mavik).

[7] Candesartan [Amias], Eprosartan [Teveten], Irbesartan [Aprovel, CoAprovel], Losartan [Cozaar, Cozaar Comp], Olmesartan [Olmetec, Olmetec Plus], Telmisartan [Micardis, Micardis Plus], Valsartan [Diovan, Co-Diovan, Exforge]

[8] Prior to elective Caesarean section at ≤ 38+6 weeks' gestation, antenatal corticosteroids decrease the excess neonatal respiratory morbidity and NICU admissions.

	For women with preeclampsia at ≥ 37+0 weeks' gestation, immediate delivery is recommended. For women with non-severe preeclampsia complicated by hemolysis, elevated liver enzymes, low platelets syndrome at 24+0 to 34+6 weeks' gestation, consider delaying delivery long enough to administer antenatal corticosteroids for acceleration of fetal pulmonary maturity if there is temporary improvement in maternal laboratory testing. All women with hemolysis, elevated liver enzymes, low platelets syndrome at ≥ 35+0 weeks' gestation should be considered for immediate delivery.
Women with Gestational Hypertension [without preeclampsia]	At ≥ 37+0 weeks' gestation, delivery within days should be discussed.
Women with Pre-Existing Hypertension	Uncomplicated pre-existing hypertension Otherwise well at ≥ 37+0 weeks' gestation, delivery should be considered at 38+0 to 39+6 weeks' gestation. For women with any hypertensive disorder of pregnancy, vaginal delivery should be considered unless a Caesarean delivery is required for the usual obstetric indications. If vaginal delivery is planned and the cervix is unfavorable, then cervical ripening should be used to increase the chance of a successful vaginal delivery. At a gestational age remote from term, women with a hypertensive disorder of pregnancy with evidence of fetal compromise may benefit from delivery by emergency Caesarean section. Antihypertensive treatment should be continued throughout labor and delivery to maintain systolic blood pressure at < 160 mmHg and diastolic blood pressure at < 110 mmHg. The third stage of labor should be actively managed with oxytocin, 5 units intravenous or 10 units intramuscular, particularly in the presence of thrombocytopenia or coagulopathy. Ergometrine maleate should not be administered to women with any hypertensive disorder of pregnancy, particularly preeclampsia or gestational hypertension; alternative oxytocic should be considered
General Principles	The anesthesiologist should be informed when a woman with preeclampsia is admitted for delivery Early insertion of an epidural catheter (in the absence of contraindications) is recommended for control of labor pain. In the absence of contraindications, all of the following are acceptable methods of anesthesia for women undergoing Caesarean delivery: epidural, spinal, combined spinal-epidural, and general anesthesia. A routine fixed intravenous fluid bolus should not be administered prior to neuraxial anesthesia.
Fluid	Intravenous and oral fluid intake should be minimized in women with

Administration	preeclampsia, to avoid pulmonary edema. Fluid should not be routinely administered to treat oliguria (< 15 mL/hr for 6 consecutive hours). For treatment of persistent oliguria, neither dopamine nor furosemide is recommended. Phenylephrine or ephedrine may be used to prevent or treat hypotension during neuraxial anesthesia.
Arterial line	Arterial line insertion may be used for continuous arterial blood pressure monitoring when blood pressure control is difficult or there is severe bleeding.
Pulmonary artery catheterization	Pulmonary artery catheterization is not recommended unless there is a specific associated indication, and then only in an intensive care unit setting.
Central venous pressure	Central venous pressure monitoring is not routinely recommended, and if a central venous catheter is inserted, it should be used to monitor trends and not absolute values.
	Upon admission for delivery women with preeclampsia should have a platelet count done. Neuraxial analgesia and/or anesthesia are appropriate in women: a. with preeclampsia, provided there are no associated coagulation concerns b. with a platelet count ≥ 75 × 109/L; c. taking low-dose acetylsalicylic acid in the presence of an adequate platelet count; d. receiving unfractionated heparin in a dose of ≤ 10 000 IU/d subcutaneously, 4 hours after the last dose and possibly immediately after the last dose without any delay; e. receiving unfractionated heparin in a dose > 10 000 IU/d subcutaneously if they have a normal activated partial thromboplastin time 4hours after the last dose; f. receiving intravenous heparin in a therapeutic dose if they have a normal activated partial thromboplastin time 4 hours after the last dose; or g. receiving low-molecular-weight heparin 10 to 12 hours after a prophylactic dose, or 24 hours after a therapeutic dose.
Diagnosis	– Peripheral smear abnormal – Total bilirubin > 1.2 mg/dl – Lactate dehydrogenase > 600 U/L – Aspartate aminotransferase >70 U / L – Platelets < 150,000 / microliter
Classification according to platelet count	– Class 1 (<0 – 50,000 /microliter, ul) – Class 2 (51,000 to 100,000 / microliter, ul l)

	– Class 3 (101,000-150,000 / microliter, ul)
Treatment	– Transfusion of 6-10 platelet concentrate at the moment of surgery – Dexamethasone 10 mg IV q 12 h until remission observed – Dexamethasone 5 mg IV q 12 h (2 additional doses) – Laboratory testing q 12 h until complication solved, thereafter q 24 h – Consider admission to ICU For a platelet count of < 20 × 109/L with hemolysis, elevated liver enzymes, low platelets syndrome, platelet transfusion is recommended regardless of mode of delivery. Corticosteroids for treatment of hemolysis, elevated liver enzymes, low platelets syndrome is not recommended until they have been proven to decrease maternal morbidity. Plasma exchange or plasmapheresis for hemolysis, elevated liver enzymes, low platelets syndrome, not recommended particularly within the first 4 days postpartum.
Cesarean Delivery	For a platelet count of 20 × 109 to 49 × 109/L with hemolysis, elevated liver enzymes, low platelets syndrome, platelet transfusion is recommended prior to Caesarean delivery.
Vaginal delivery	For a platelet count of 20 × 109 to 49 × 109/L with hemolysis, elevated liver enzymes, low platelets syndrome, platelet transfusion should be considered prior to vaginal delivery if there is excessive active bleeding, known platelet dysfunction, a rapidly falling platelet count, or coagulopathy.
Cesarean or vaginal delivery	For a platelet count of ≥ 50 × 109/L with hemolysis, elevated liver enzymes, low platelets syndrome, platelet transfusion and/or packed red blood cells should be considered prior to either Caesarean or vaginal delivery only if there is excessive active bleeding, known platelet dysfunction, a rapidly falling platelet count, or coagulopathy.
Within first six weeks	Measure BP during the time of peak postpartum BP, at days 3 to 6 after delivery. Women with postpartum hypertension should be evaluated for preeclampsia (either arising de novo or worsening from the antenatal period). Consideration should be given to continuing antihypertensive therapy postpartum, particularly in women with antenatal preeclampsia and those who delivered preterm. Severe postpartum hypertension must be treated with antihypertensive therapy to keep systolic blood pressure < 160 mmHg and diastolic blood pressure < 110 mmHg. In women without co-morbidities, antihypertensive therapy should be considered to treat non-severe postpartum hypertension to keep the BP < 140/90 mmHg. Women with co-morbidities other than pre-gestational diabetes mellitus should be treated to keep BP < 140/90 mmHg

	Women with pre-gestational diabetes mellitus should be treated to keep blood pressure < 130/80 mmHg. Antihypertensive agents generally acceptable for use in breastfeeding include the following: Nifedipine XL, labetalol, methyldopa, captopril, and enalapril. There should be confirmation that end-organ dysfunction of preeclampsia has resolved. Non-steroidal anti-inflammatory drugs should not be given postpartum if hypertension is difficult to control, there is evidence of kidney injury (oliguria and/or creatinine≥ 90 μM), or platelets are < 50 to 109/L. Postpartum thromboprophylaxis should be considered in women with preeclampsia, particularly in the presence of other risk factors.
Beyond 6 weeks postpartum	Women with a history of severe preeclampsia (particularly those who presented or delivered before 34 weeks' gestation) should be screened for pre-existing hypertension and underlying renal disease. Referral for internal medicine or nephrology consultation (by telephone if necessary) should be considered for women with: (i) postpartum hypertension that is difficult to control, or (ii) women who had preeclampsia and have at 3-6 months postpartum either ongoing proteinuria, decreased estimated glomerular filtration rate (eGFR) (< 60 mL/min), or another indication of renal disease, such as abnormal urinary sediment. Women who are overweight should be encouraged to attain a healthy body mass index to decrease risk in future pregnancy and for long-term health. Women with pre-existing hypertension or persistent postpartum hypertension should undergo the following investigations (if not done previously) at least six weeks postpartum: urinalysis; serum sodium, potassium and creatinine; fasting glucose; fasting lipid profile; and standard 12-lead electrocardiography. Women who are normotensive but who have had a hypertensive disorder of pregnancy, may benefit from assessment of traditional cardiovascular risk markers. All women who have had a hypertensive disorder of pregnancy should pursue a healthy diet and lifestyle.
	Clinicians should be aware that gestational hypertension and preeclampsia may each be associated with an increase in adverse pediatric neurodevelopmental effects, such as inattention and externalizing behaviors (e.g., aggressiveness). Clinicians should be reassured that there is no compelling evidence that antihypertensive medications (specifically labetalol, Nifedipine, or methyldopa) are themselves associated with clear adverse neurodevelopmental effects.
	Health care providers should be alert to symptoms of posttraumatic stress following a hypertensive disorder of pregnancy and refer women for appropriate evaluation and treatment. Health care providers should inform their patients, antepartum and postpartum, about preeclampsia, its signs and symptoms, and the importance

	of timely reporting of symptoms to health care providers. Re-emphasized information at subsequent visits.

Table 28 Drugs used for treating hypertension during pregnancy

Drug	Commercial name	mg/day	Divided in doses	Action mechanism
Methyldopa	Aldomet	500-3000	2-3	Central
Hydralazine	Apresoline	25-200	2-3	Direct vasodilator
Nifedipine	Adalat	30-60	3	
Atenolol	Tenormin	25-100	1	Beta adrenergic 1 blocker

Table 29 Hypertensive crisis medications

Medication	**Recommendations**
Hydralazine	- Bolus: 5 mg IV stat, if not controlled, repeat in 20 minutes (5-10 mg) according to response rate. - Once BP is under control repeat as necessary. - If desirable response not achieved after administering 20 mg, change to nifedipine.
Nifedipine	10 mg oral (sublingual) and repeat 10-30 minutes after, according to clinical response (maximum dose is 30 mg).
Labetalol	Bolus IV 20 mg, if suboptimal result administer 40 mg 10 minutes after and 80 mg every 10 minutes in two additional doses. If desired response not achieved, change to another medication.
Diazoxide	Microbolus of 30 mcg q 10 minutes up to three doses
Isoxsuprine	0.25 – 0.5 mg/min. 500 ml D5W IV at 10 ml/hour.
Sodium nitroprusside	0.25 mug / (Kg x min) IV and increase according to response up to 5 mug / Kg x min maximum. Fetal toxicity may occur if used beyond 4 hours.

Table 30 Laboratory testing for patients with pre-eclampsia / eclampsia

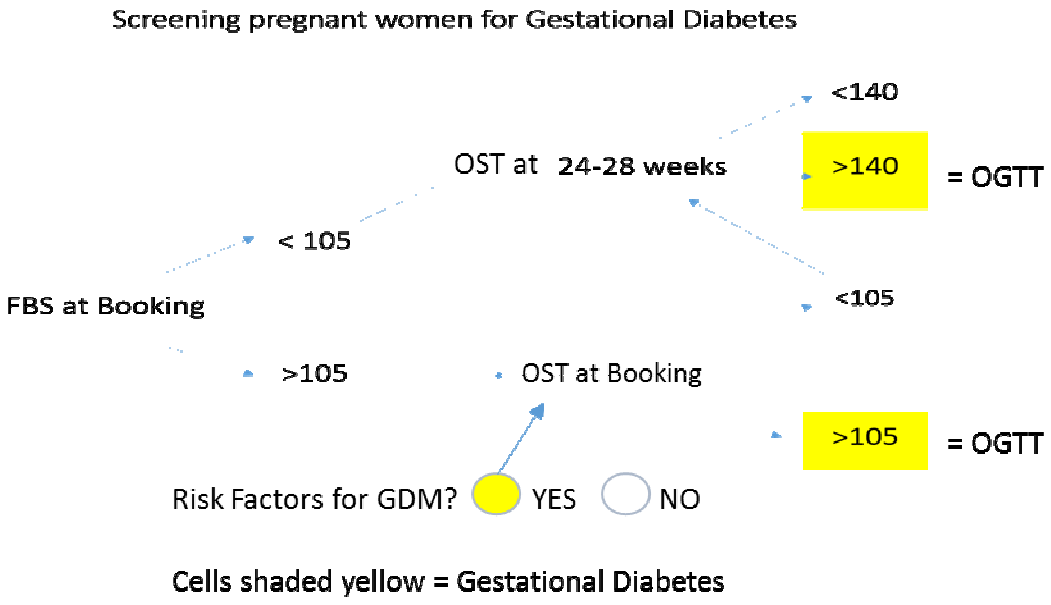
Test	Normal value	Frequency	Rationale
Hemoglobin	>11 g/dl	Weekly or 2 times / week	Hemoconcentration is related to preeclampsia and indicates severity. Can decrease in case of hemolysis
Hematocrit	>35 mm		
Platelet count	>150,000 cell/mm3	Weekly or 2 times / week	Thrombocytopenia suggest severe pre-eclampsia
Dipstick proteinuria	< 1+	Daily or Weekly	Pre-eclampsia or superimposed pre-eclamspia
24 hour urine protein	< 300 mg/dl	Weekly or 2 times / week	
Serum creatinine	<1.5 mg/dl	Weekly or 2 times / week	Impaired renal function
Uric acid	<4 mg/dl	Weekly or 2 times / week	Impaired renal function
Aminotransferase aspartate	<70 U/L	Weekly or 2 times / week	Hepatopathy
Total bilirubin	<1.2 mg/dl	Weekly or 2 times / week	Hemolysis Hepatopathy
Coagulation time		Weekly or 2 times / week	Disseminated intravascular coagulation
Peripheral smear		Weekly or 2 times / week	Spherocyte Schizocyte
Fibrinogen	>300 mg/dl	Weekly or 2 times / week	DIC
Fibrin degradation products	<40 mcg/ml	Weekly or 2 times / week	DIC
Lactate dehydrogenase	<600 U/L	Weekly or 2 times / week	Hemolysis Hepatopathy

Coagulation abnormality or impaired renal/hepatic function may be of great risk for the patient life, it may be necessary terminate pregnancy even with a moderate hypertension.

C. Gestational diabetes

Steps before referring to OBGYN		
Screen and diagnosis	FBS OST – 1 hour GDM Test OGTT – 2 hour GDM Test	Refer patients with gestational diabetes to OBGYN for further evaluation and management

✓ Screen all pregnant women for Gestational Diabetes



✓ If any of the risk factors below are present, indicate OGTT STAT

- — Family history of Diabetes Mellitus
- — History of macrosomia (greater than 4000 grams)
- — History of a previous stillbirth
- — Pre-pregnancy weight more than 120% ideal weight or BMI _____
- — 30 years of age or older

✓ If none of the above risk factors are present indicate FBS and based on results indicate O'Sullivan test at 24-28 weeks gestation or OGTT

GDM cut off values: FBS	OST or OGTT 1 hour	OGTT 2 hours
>105 mg/dl	>140 mg/dl	> 105 mg/dl

Diagnosis of Gestational Diabetes Mellitus

- Pregnant + risk factors for GDM + OST > 140 + OGTT > 105
- OST 140-199 mg/dl: 3 hour GTT
- OST = 200 mg/dl: FBS the next morning
- FBS = >105 mg/dl = Diabetes
- FBS = <105 mg/dl: 3 hour GTT as scheduled and evaluate results
- **GTT Test values** (2 abnormal values are required to establish the diagnosis of Gestational Diabetes)

✓ Normal blood values for a 100-gram oral glucose tolerance test used to screen for gestational diabetes:

- Fasting: less than 95 mg/dL
- 1 hour: less than 180 mg/dL
- 2 hour: less than 155 mg/dL
- 3 hour: less than 140 mg/dL

Management

- Type A1: abnormal oral glucose tolerance test (OGTT) but normal blood glucose levels during fasting and 2 hours after meals; diet modification is sufficient to control glucose levels
- Type A2: abnormal OGTT compounded by abnormal glucose levels during fasting and/or after meals; diet and additional therapy with insulin required.

✓ **Refer to high risk clinic at diagnosis**

	FBS and 2 hour test after meals FBS	
OGTT	Normal	Abnormal
Normal		
Abnormal	Diet modification	Diet modification Insulin

Notes

a. The risk of mothers with Insulin-Dependent Type I Diabetes is 6 to 8-fold that of the general population for adverse embryofoetal outcomes.

b. The risk of mothers with Non-Insulin-Dependent Type 2 Diabetes Mellitus is 3 times as high the risk in the general population for adverse embryofoetal outcomes.

c. Mothers with Gestational Diabetes have twice the risk of the general population for adverse embryofoetal outcomes.

D. Convulsions during pregnancy

Any convulsions during pregnancy with no previous history of origin or unable to obtain history from patient, especially in the third trimester, intrapartum or post-partum, it should be considered eclampsia and should be treated as such.

Immediate referral to nearest hospital, start treatment with magnesium sulfate

- ✓ **Treat as pre-eclampsia**
  - — Other possible causes: epilepsy, accidents, tumours

Post-Partum Differential Diagnoses

- — Epileptic Crises
- — Shock syndrome during pregnancy
- — Vein thrombosis
- — Dilution
- — Dysfunction in patients with medulla cervical lesions
- — Adverse reactions (e.g. bupivacaine)

Management

- — Folic acid 5 mg per day for the first months and continue with 1mg per day until delivery.
- — Avoid changes in medication and adjust dosage according to clinical response to .
- — Provide iv doses in the third trimester to patient free from convulsions with lowest doses possible phenytoin),
- — Oral vitamin K : 20 mg/day at 36 and intramuscular (Vitamin K1 25 mg) labor.
- — Provide client with calcium supplement during if they are on , phenobarbital or pyrimidine.

- ✓ Avoid alcohol and sedatives.
- ✓ If any client is having an epileptic crises:
  - — evaluate circulation, airway and breathing (CAB) ,
  - — resuscitate
  - — reevaluate and monitor
  - — Call ambulance
  - — Refer hospital

E. Prevention of Group B Streptococcus (GBS)

Steps before referring to OBGYN

Screen to determine at risk patients	Request anovaginal culture	Treat positive cases as recommended in protocol and counsel	Document management on CLAP Form	Refer to OBGYN for further evaluation and management of complications

- ✓ **Determine Risk factors for perinatal GBS-related infections**
  - GA <37 weeks [in labor]
  - ruptured membranes >8 hours.
  - >38ºC suggesting **ovum infection**

- ✓ **Diagnosis of GBS**
  - ano-vaginal culture for GBS

- ✓ **Indication for GBS culture** [women between 35 and 37 weeks of gestation with the following conditions]:

  - Urinary tract infections
  - Other infectious processes during pregnancy (endometritis or sepsis)
  - Premature rupture of membranes > 18 hours
  - Premature delivery

Table 31 Recommended plans for prophylactic intrapartum treatment by OBGYN

Penicillin G	5 million units i/v (starting dose), 2.5 million units i/v every 4 hours up to delivery
Alternative	
Ampicillin	2 g i/v (starting dose) 1 g i/v every6 hours FRO 48 hrs
Allergy to penicillin	
Cefazoline	2 g i/v (starting dose) 1 g i/v every 8 hours up to delivery

✓ Plan Cesarean Section

GBS can cross the intact membranes; cesarean sections fail to prevent vertical mother-to-child transmission. Nevertheless, fetal colonization is exceptional when elective cesarean section is performed in the absence of labor and with preserved membranes. Hence, prophylactic therapy is not recommended as a routine in these cases.

Notes

— Group B Streptococcus (Streptococcus agalactiae) is capable of causing invasive disease in newborns and pregnant women, especially in women with special medical conditions (e.g. diabetics).

— In pregnant women GBS can cause urinary tract infections, **ovum infection** endometritis, or sepsis; premature delivery or fetal death.

— Maternal colonization is the main risk factor for vertical transmission of neonatal streptococcus, especially when there is rupture of the membranes.

— In newborns it usually presents with bacteraemia, pneumonia or meningitis. Other syndromes (cellulitis and osteomyelitis) have also been reported. About 25% of the cases of GBS-related neonatal infections occur in preterm children.

F. Anemia during pregnancy

Steps before referring to OBGYN				
Screen and diagnosis	Treatment	Follow up testing	No improvement,	Refer to OBGYN for further evaluation and management

Table 32 Management of anemia during pregnancy

Screen and diagnosis	Complications	Treatment
Hb at first contact, 36 weeks GA, more often if indicated Hb < 11 mg/dl Signs and symptoms Fatigue, Weakness and light headedness, Fainting, Edema, Dyspnea, Tachycardia, Pallor, Hypotension	IUGR, Delayed healing, Risk for infections, Congestive heart failure, Post-partum hemorrhage, Death	If Hb less than 11 gr/dl indicate CBC and Mean Corpuscular Volume (MCV) MCV less than 79fL = microcytic anemia MCV greater than 100 fL, consider macrocytic anemia Treat and indicate next Hb within one month Hb = 7 gr/dl, treat with oral ferrous sulphate, 650 mg PO/day x 3 months and Hb = 7 gr/dl or poor improvement, treat with parenteral iron, Dextran, 100 mg, alternate days for a total of 1000 mg x 3 weeks If constitutional symptoms are present, refer to OBGYN consider blood transfusion Folate 1 mg PO BID if folate deficiency is suspected **If there is no improvement with oral and parenteral iron, refer to OBGYN**

G. Sickle Cell Disease [SCD]

Steps before referring to OBGYN				
Screening and medical history	Diagnosis	Laboratory investigations	Counseling on alert and danger signs	Refer to OBGYN for treatment and follow up plan

- **Recommended contraceptive methods.** Oral and IM contraceptives and barrier methods
- **Hydroxyurea.** Women and men who are taking hydroxyurea should use contraceptive methods and discontinue the drug if they plan to conceive a child or become pregnant.

— Pregnancy in SCD is considered to be high risk because of the underlying hemolytic anemia, sickle cell crises and multiorgan dysfunction associated with the disorder

First antenatal visit

- ✓ Detailed medical history with emphasis on previous crises and their pattern
- ✓ Detailed past obstetric history
- ✓ Identify and treat intercurrent medical conditions
- ✓ Establish gestational age [women with SCD are at increased risk of intrauterine growth restriction and may need early delivery]
- ✓ Laboratory test: reticulocyte count, serum ferritin level, and liver and renal function tests. Screen for Hepatitis B, Group and Rh, HIV, urine culture
- ✓ Other test: ultrasound, echocardiogram [pulmonary hypertension] and lung function testing [oxygen saturation]
- ✓ Folic acid 5mg/day
- ✓ Iron supplements only if indicated -by a low serum ferritin level-
- ✓ History of hepatitis B and pneumococcal vaccinations; use of penicillin V 250 twice a day as hyposplenism is common and encapsulated organisms pose a risk of overwhelming sepsis.
- ✓ Recommend to remain well hydrated and avoid heavy physical exertion, a cold environment and stress.
- ✓ In view of the high risk of pre-eclampsia, and evidence for the efficacy of low-dose aspirin in reducing this by 15% in high-risk women, use 75 mg soluble aspirin daily from early pregnancy (CLASP study).
- ✓ Women should be advised to report early if there are any signs of infection or impending crisis, and not to self-manage (as they might do out of pregnancy) but to have a low threshold for seeking medical help, particularly because of the risk of a rapidly developing chest crisis.
- ✓ Refer to OBGYN
- ✓ Follow up Prenatal visits as per OBGYN recommendations
- ✓ Serial growth scans should be performed in the third trimester
- ✓ If intrauterine growth restriction or a co-morbid medical condition is present, indicate umbilical artery Doppler velocimetry and estimate liquor volume.
- ✓ In the absence of an obstetric indication, spontaneous labour at term should be awaited.

H. Thyroid Disease in Pregnancy

Steps before referring to OBGYN				

- ✓ Once any of the thyroid diseases in pregnancy are detected, women are to be referred to a specialist's care and managed via high risk clinic.

Thyroid disease is the second most common endocrine disease affecting women of reproductive age. Both hyperthyroidism and hypothyroidism may initially manifest during pregnancy. Conditions such as gestational trophoblastic disease or hyperemesis gravidarum, may affect thyroid function.

Hyperthyroidism is characterized by an excessive production of and exposure to thyroid hormone (thyrotoxicosis), resulting from the hyper functioning the thyroid gland. Graves' disease is the most common cause of hyperthyroidism.

Diagnosis

Signs and symptoms include tremours, tachycardia, frequent bowel movements, excessive sweating, heat intolerance, weight loss, goiter, insomnia, palpitations and hypertension. These symptoms are not specific to hyperthyroidism and may be present during pregnancy, making the diagnosis more elusive. Dermatopathic and ophtamopathic findings are associated with Graves' disease.

Hypothyroidism is caused by thyroid hormone production. Patients having one autoimmune disease have more likelihood of developing another autoimmune disease. Women with Type I diabetes have a 25% risk of developing postpartum thyroid dysfunction.

Diagnosis

Signs and symptoms include fatigue, constipation, intolerance to cold, muscle cramps, hair loss, dry skin, prolonged relaxation phase of deep tendon reflexes, and carpal tunnel syndrome are initially nonspecific but may progress to weight gain, intellectual slowness, voice changes, and insomnia.

Table 33 Laboratory test values – Thyroid function

Changes in Thyroid Function Test Results in Normal Pregnancy and in Thyroid Disease						
Maternal status	TSH	FT4	FTI	TT4	TT3	RT3U
Pregnancy	No change	No change	No change	Increase	Increase	Decrease
Hyperthyroidism	Decrease	Increase	Increase	Increase	Increase or no change	Increase
Hypothyroidism	Increase	Decrease	Decrease	Decrease	Decrease or no change	Decrease
Abbreviations: TSH, thyroid-stimulating hormone; FT4, free thyroxine; FTI, free thyroxine index; TT4, total thyroxine; TT3, total triiodothyronine; RT3U, resin T3 uptake.						

Postpartum thyroiditis is an autoimmune inflammation of the thyroid gland that presents as new-onset, painless hypothyroidism, transient thyrotoxicosis, or thyrotoxicosis followed by hypothyroidism within 1 year postpartum.

I. HIV during pregnancy

Steps before referring to OBGYN				
Screen and diagnosis	Laboratory screening	Start treatment Counseling and adherence	Refer to OBGYN for further evaluation and management	Screen all pregnant women with negative HIV result upon admission for childbirth Notify L&D and ensure treatment is available for those infected with the virus

- ✓ HIV screening tests to be requested and carried out during first encounter if HIV status is unknown or last test done resulted negative.
- ✓ Register results; write the code 012 on the CLAP form based on result from confirmatory tests
- ✓ Nurse/doctor builds a trusting relationship with client, ensuring confidentiality
- ✓ Do a PPD test
- ✓ Order complete blood work (Hb, FBC, BUN, Creatinine, CD 4, complete urinalysis)
- ✓ If client is not on treatment, initiate treatment as per protocol at 14 wks gestational age (REGARDLESS OF CD4 result) or as soon as possible thereafter
- ✓ Refer client to MO / OBGYN for further evaluation
- ✓ Attending nurse or doctor is to provide health information and education relevant to HIV and pregnancy to client and ensure all questions and doubts are properly addressed.
- ✓ Mother to be given the choice to breastfeed but **must also be told** of the risk of transmitting the disease through breastfeeding and that milk substitute will be made available for her exposed infants for the first ten months of life through the Public Health Nurse
- ✓ Discuss treatment with client and the importance of adherence. Explain that treatment is for lifetime, it will be continued beyond pregnancy. Treatment during pregnancy and childbirth and treatment of the infant starting at birth is to prevent the transmission of the virus to the infant
- ✓ Educate on safer sexual practices and HIV during and after pregnancy and to include family planning options.
- ✓ Inform client the need for HIV screening of infant. PCR [at birth, 6 and 12 weeks of life] and ELISA [18 months] before discharge as HIV negative
- ✓ For more details, see EMTCT protocol

Table 34 **Treatment for HIV during pregnancy**

Zidovudine (AZT) during pregnancy, starting on Week 28 (from CLAP)
AZT and Lamivudine (3TC), plus one single dose of Nevirapine (NVP) during delivery
AZT for one week and a single dose of NVP, for the newborn. If the mother received less than 4 weeks of AZT during pregnancy, AZT administration to the child should be extended to 4 weeks.

J. Syphilis

Steps before referring to OBGYN				
Screen and diagnosis	Treatment and laboratory follow up,	No improvement, Refer to OBGYN for further evaluation and management	Report case to L&D	Screen all non-infected pregnant women on admission for childbirth Treat if positive

- ✓ Explore if there is history of syphilis infection before pregnancy
- ✓ Screen for syphilis with RPR (rapid test) at first contact, at 28-32 weeks gestation and initiate treatment if positive
- ✓ Screen for Syphilis at admission for delivery and treat if result is positive.
- ✓ Follow syndrome management for syphilis [see manual]

Notes

- — All women should be screened serologically by treponemal or nontreponemal antibody testing and, if syphilis is confirmed, they must receive treatment
- — Any woman who delivers a stillborn infant after 20 weeks gestation should be tested for syphilis before hospital discharge.
- — No infant should leave the hospital without the maternal serologic status having been determined at least once during pregnancy.

K. Hepatitis B during pregnancy

Hepatitis B is a serious disease caused by the hepatitis B virus.

- ✓ Test all pregnant women for hepatitis b surface antigen (HBsAg) at first contact, ideally in first trimester (even if a woman has been previously vaccinated or tested).
- ✓ Report positive test to PHN
- ✓ Notify hospital staff of the positive cases
- ✓ Highlight the need for single antigen hepatitis B vaccine and hepatitis B immune globulin (HBIG) at birth
- ✓ Counsel the mother on the need for immune prophylaxis before delivery and post-

exposure prophylaxis at birth, information on mode of transmission, breastfeeding (infants may be breastfed), follow up (medical evaluation and possible treatment of chronic hepatitis B) and substance abuse treatment,(if appropriate).

- ✓ Advise the mother that all household, sexual and needle-sharing contacts should be tested for HBV infection and vaccinated if susceptible
- ✓ Refer the mother to a medical specialist for evaluation of chronic hepatitis B.

— At time of admission for delivery

- — Review hepatitis B surface antigen (HBsAg) status of all pregnant women
- — Record maternal HBsAg test results on both labor and delivery record and on infants delivery section on CLAP Form
- — Perform HBsAg testing as soon as possible on women who:
  - — Do not have documented HBsAg test result
  - — Are at risk for hepatitis B virus (HBV) infection during pregnancy (e.g. >1 sex partner in the previous 6 months, evaluation or treatment for a sexually transmitted infection, recent or current injection-drug use, or HBsAg positive sex partner:; or
  - — Had clinical hepatitis since previous testing

L. Malaria

Steps before referring to OBGYN		
Screen and diagnosis	Treatment and follow up,	No improvement, Refer to OBGYN for further evaluation and management

Malaria is an infection caused by a protozoan of the Plasmodium species (vivax, falciparum), transmitted through the bite of the female Anopheles mosquito.

Symptoms

— Flu like condition, headaches, fatigue, abdominal discomfort, muscle and joint pain, chills, sweating, anorexia and fever [sometimes slight and during the entire day]

Clinical Diagnosis. Occurrence of fever within the 3 days prior to consultation in the absence of any severe condition

Parasitology Diagnosis. Light Microscopy: high sensitivity and specificity, "gold standard" best result when sample taken during fever or episode of chills

Rapid Diagnostic Tests (RDTs). PCR, frequently used to detect mixed infections, especially when the parasite counts are low.

Management

- ✓ **Drugs contraindicated during pregnancy:** Mefloquine, Primaquine and Tetracyclines, Amodiaquine, Chlorproguanil-Dapsone, Halofantrine, Lumefantrine and Piperaquine.

Treatment of uncomplicated Malaria falciparum during pregnancy.

First trimester: Quinine + Clindamycin for 7 days.

— Avoid the use of artemisinin-containing combination therapy (ACT) unless it is the only effective therapy available.

Second and third trimesters: ACT + Clindamycin for 7 days or, Quinine + Clindamycin for 7 days.

- ✓ Exposure to antimalarial during early pregnancy is not a cause for interrupting pregnancy.
- ✓ Treat anemia with iron and folic acid
- ✓ Use of insecticide-treated nets.
- ✓ Preventive therapy (IPT), to be applied in high-transmission areas.
- ✓ Follow up consultation in 3 days and assess improvements. If no improvement, refer for hospital management.

Notes

— Prevention of malaria during pregnancy

— Control the effects of malaria infection in pregnant women and their fetuses with the interventions below:

  - o Treatment of the woman with malaria, her anemia and the other consequences of infection.
  - o Use of insecticide-treated insect nets (this could reduce the number of malaria related deaths by one fourth).
  - o Intermittent preventive therapy (IPT), to be applied in high-transmission areas.
  - o Malaria infection that occurs in the first trimester typically causes abortion; in third trimester it causes premature delivery.
  - o Other consequences generally associated with malaria falciparum include hypoglycemia, hyperpyrexia, severe hemolytic anemia and pulmonary edema.

— In high-prevalence areas (10 to 65%), malaria contributes during pregnancy with:

  - — 2 to 15% of maternal anemia,
  - — 13 to 70% of Intrauterine Growth Restriction,
  - — 8 to 14% of Low Birth Weight,
  - — 8 to 36% of prematurity and
  - — 3 to 8% of child deaths.

Table 35 Intervention strategies against malaria during pregnancy -low-transmission scenario

Case management	Preventive intermittent therapy	Insecticides treated nets
High risk of active malaria Screen for malaria Treat with recommended antimalarial drugs + iron and Folic Acid supplements Early diagnosis and treatment	Provide PTI (after perceiving fetal movements) during the prenatal controls at weeks 26 and 32. Administer from 2 to 3 dosages separated by at least a one-month-interval. The drug of choice is Sulfadoxine-pyrimethamine (SP),	Start using them in pregnancy and extend their usage after delivery.

- Untreated, severe malaria is often lethal.
- A serious case usually presents with one or more of the following symptoms: comma (malarial brain impairment), metabolic acidosis, severe anemia, and hypoglycemia.
- Adults may present with acute renal failure or acute pulmonary edema [mortality rates reach up to 15 to 20% even despite therapy].
- I**n stable areas where transmission is high** the most severe manifestations usually occur in childhood. Adolescents and adults are partially immune and they rarely present the clinical disease. Immunity is reduced during pregnancy and it may be lost when the women move away from the transmission areas.
- **In unstable areas where the transmission of Malaria is low,** (the disease remains endemic) the low inoculation rates delay the acquisition of immunity; this causes the acute infection of subjects in all age groups (children, youths and adults), and if the subject is not treated, the risk of progressing to severe forms of the disease is high.

M. Mal presentations

- ✓ Perform Leopold's maneuvers to determine mal presentations
- ✓ Determine gestation age
- ✓ Assess fetal well being
- ✓ Order ultra sound
- ✓ Refer to MO for evaluation
- ✓ Prevent macrosomia by ensuring adequate treatment of the diabetic mother
- ✓ Refer to OBGYN for induction if patient has excessive weight gain and prolonged pregnancy with macrosomic fetus
- ✓ Refer to OBGYN all mal presentations > or equal to 36 weeks
- ✓ Remind client to ensure one unit of blood by 32 weeks gestation

✓ **Brow presentation**

The fetal head is deflexed; the presenting part is the anterior fontanel and frontal head.

Diagnosis: [1] physical examination: 2 perceived prominences (occipital on one side and inferior maxillar on the other side)**,** Fetal heart rate heard better at fetal sides**, [2]** Ultra sound result

Face presentation

Diagnosis: [1] physical examination: De-flexion of fetal head, presenting part is the sub mental diameter, Prominent occiput**,** Depression noted between head and fetal body**,** Menton felt at opposite side **[2]** Ultrasonography

Transverse presentation

Diagnosis: [1] physical examination: Fetal presentation where the cephalo-caudal perpendicular to the uterus**,** on inspection the abdomen is ovoid with longest diameter in transverse lie, Uterine fundus feels empty**,** Absence of presenting part at area**,** Fetal heart rate auscultated around the umbilicus

Shoulder Dystocia

This usually occurs at time of labour when the presenting part is the shoulder

Risk factors

I. Fetal macrosomia

II. Uncontrolled diabetes

III. Prolonged gestation with macrosomia

IV. Maternal obesity

N. Asthma in pregnancy

Refer to OBGYN

Asthma in pregnancy exacerbates between 24 and 36 weeks gestation.
Poorly controlled asthma can lead to:

- Hyperemesis gravida
- Hypertensive disorders
- Hemorrhagic accident
- Complicated delivery
- Threatened preterm labour

Diagnosis

Physical findings: Sweating, agitation, dyspnea, orthopnea, sometimes cyanosis, reduced respiratory movements. **Percussion**: cardiac and hepatic dullness. Increased pulmonary sounds. **Auscultation:** hoarse rales and wheezing. **Expectoration**: difficult, scarce and viscous, sometimes

with expulsion of Curschman spirals. **Vital signs**: Pulse > 130 x' minute may indicate increased hypoxemia. **Laboratory:** FBC, oxygen saturation,

Classify type of asthma

- ✓ Mild and intermittent asthma: beta adrenal as per need: salbutamol: aerosol, [prolonged action]: Salmeterol. No maintenance treatment required.
- ✓ Mild and persistent asthma: cromoglicate sodium (Intal y nedocromil, Ketotiphen add inhaled steroids if there is poor response
- ✓ Moderate and persistent asthma: inhaled steroids: Beclometasona, Budesonida [most recommended during pregnancy due to prolonged action] Fluticasone. Add salmeterol or bromuro de ipratropion o teofilina, if poor response.
- ✓ Severe and persistent asthma: Add oral steroids to treatment described above, assess the use of antileucotrienos: Zafirlukast Montelukast , especially for those with successful use before pregnancy and in need of prednisone 60 mg or more daily.

Considerations on inhaled steroids:

- — Use the ones that come in spray form.
- — Use a beta-agonist to improve lung penetration
- — The initial recommended dose of beclomethasone (50 mcg / puff), are 4 puffs w / 8 hours, could be increased to 2000 mg / day.
- — Can be combined with oral steroids, to reduce their doses.
- — Decreasing the dose of oral steroids should be from the third day of entry of inhaled steroids.
- — They can cause thrush, wash the oral cavity after use.
- — Weekly follow ups until symptoms improved.
- — For monitoring of patients with chronic persistent asthma assess measurements of peak expiratory flow (PEF).

Asthma crisis

- ✓ Hospital admission, regardless of gestational age, duration of the crisis and severity of asthma and also:
- ✓ Steroid dose-dependent 60-80mg/day not responding to outpatient treatment.
- ✓ PEF <60% or variability> 30% that remained asymptomatic or slightly symptomatic.
- ✓ Suspected complications of the disease or pregnancy.
- ✓ Association with other decompensated medical illnesses.
- ✓ Severe forms of potentially fatal asthma (stratification risk), sub-diagnosed in some media.

The early admission guarantees:

- — Continuing medical observation by trained personnel.
- — Oxygen Administration. Its absence is a major cause of complications

- Conduct an objective assessment of the sequential severity and response to treatment by plotting their PEF values and indicate serial blood gas.
- Provides the possibility of crisis control and reinstate the patient to normal activities in a shorter period of time.
- Screening and early treatment of complications of the disease and treatment
- Perform continuous fetal and maternal monitoring and decide when the best time for pregnancy interruption is.

Patients requiring intensive care unit (ICU):

1. Cyanosis
2. Anxiety
3. Headache
4. Respiratory rate of 40 per minute
5. Heart rate above 120 per minute
6. Exhaustion of sick
7. Patient with respiratory silence (blocking)
8. Decreased consciousness

O. Vaginal discharge (leucorrhea)

Steps before referring to OBGYN		
Screen and diagnosis	Treatment and follow up,	No improvement, Refer to OBGYN for further evaluation and management

Leucorrhea may occur as a result of the presence of organisms such as Candida albicans, Gardnerella vaginalis, Chlamydia trachomatis, Trychomona, Mycoplasm and Neisseria gonorrhea, among others.

Table 36 Treat leucorrhea as per causal agent

Discharge	Name and causal agent	Frequency	Signs and Symptoms	Treatment
White, lumpy, sticky, curd-looking	Moniliasis of vulva and vagina (Candida Albicans)	25% at the end of pregnancy	Itching Burning sensation	clotrimazole vaginal cream or suppositories x 7 days Asymptomatic sexual partner requires no treatment

Discharge	Name and causal agent	Frequency	Signs and Symptoms	Treatment
White, grayish fish-smelling discharge	Bacterial Vaginosis (Gardnerella or Haemophillus vaginalis, Mycoplasma hominis, Prevotellasp, Mobiluncussp)			Metronidazole per os, at 500 mg b.i.d. x 7 days, vaginal gel or suppositories x 5 consecutive nights. Asymptomatic sexual partner requires no treatment.
Foul-smelling, light green, foamy discharge	**Trychomoniasis** (Trychomonas)	20%	Usually asymptomatic; pruritus, reddening and finely mottled hemorrhages on cervix and vagina (strawberry cervix)	Metronidazole PO 2 g in a single dose or 500 mg 2 x day x 7 days to the pregnant woman and her sexual contacts, or Tinidazole 2 g per os in a single dose or Metronidazole suppositories or vaginal gel for 5 nights.
Purulent discharge	**Gonococcia** **(**Neisseria gonorrhoeae)		Asymptomatic or inflammatory local reaction with mucopurulent exudate of endocervix and/or urethral mucosa, possibly dysuria, polyuria and vesical tenesmus.	Single IM dose of Penicillin G 5.000.000 U or a single dose of Ceftriaxone 125 mg PO, or Cefixime 400 mg PO
Typically yellowish and tends to involve the endocervix	**Chlamydiasis** **(**Chlamydia trachomatis)		dyspareunia, bleeding and urethritis	Both the pregnant woman and her sexual partner must be treated with a single oral dose of Azithromycin 1 g or Amoxicillin 500 mg per os t.i.d. x 7 days.
	Herpes simplex **(**Type II herpes, or vulvar herpes)		Multiple itchy or painful vesicles that turn yellowish white and subsequently develop ulcers dysuria, pain and occasionally fever	Acyclovir 400 mg PO t.i.d. for 7 days. Alternatively, topical 5% Acyclovir cream for 5 days, or Valacyclovir 1 g PO b.i.d x 7 days

Follow-Up

- ✓ Patients should be instructed to return for follow-up visits only if symptoms persist or recur within 2 months of onset of the initial symptoms.

P. Chagas Disease

Refer to OBGYN

- ✓ Symptomatic cases often present with premature birth, low birth weight and hepatosplenomegaly.
- ✓ Some patients may present with anasarca and acute respiratory syndrome. Meningo encephalitis and myocarditis are more frequent when there is HIV co-infection.

Diagnosis

- ✓ Serologic testing in pregnant woman [endemic infection] to detect specific antibodies against Trypanosome cruzii
- ✓ At least two standardized serologic reactions IHA-IFI, IHA-ELISA and ELISA-IFI [confirmatory diagnosis]
  - — IHA: Indirect Hemagglutination.
  - — IFI: Indirect immunofluorescence.
  - — ELISA: Immune enzymatic assay.

Treatment of the mother

- ✓ Chemotherapy is contraindicated during pregnancy
- ✓ Test infected mother to rule out heart impairment and to guarantee a safe and good quality obstetric care.

Treatment of the newborn

- ✓ If the test is positive the family must be informed about the procedures and therapies applicable to the newborn. The recommendations below apply to the children whose mothers have positive Chagas serology:
- ✓ Direct parasitology screening of the newborn: micro hematocrite (MH)
- ✓ Subsequent conventional serology screening – at the age of 9 to 12 months.
- ✓ Criteria suggesting congenital Chagas [60 to 90% of the cases of congenital infection are symptom-free, There are no specific clinical markers of congenital infection of Chagas Disease]
  - — newborn born to a mother with positive T cruzi serology,
  - — Parasites identified at birth or parasites or non-maternal specific antibodies detected after birth, unless there is a history of blood transfusions or vector contamination in the past.

Treatment for congenital Chagas

- ✓ Refer to pediatrician for management [Nifurtimox 10 mg/kg/day, followed by Benznidazole at 5 mg/kg/day for 30 days]

Notes

- ✓ Chagas disease is a widespread infectious disease endemic in 21 countries in the region.
- ✓ Increased migration has led to an increase in the frequency of congenital infections by T.

Q. Pregnancy and heart disease

Refer to OBGYN

All pregnant women must have a thorough history and physical assessment at first contact or when signs and symptoms are present.

- — Investigate pre-existing cardiac conditions: A family or personal history of congenital heart disease, A history of hypertension, A history of breathlessness, fatigue, or oedema.
- ✓ On first prenatal visit patients with known or suspected heart disease must undergo thorough physical examination
  - Conduct heart and pulmonary auscultation
  - Assess for jugular regurgitation in sitting and supine positions, presence/absence of edema, digital clubbing, and cyanosis
- ✓ Routine prenatal laboratory and ultrasonography
- ✓ Consultation with internist or, where available, cardiologist.
- ✓ Perform echocardiography if indicated by specialist
- ✓ Refer to high risk clinic
- ✓ Patient follow up will be routine for low risk lesions and as determined by specialist for intermediate and high risk lesions
- ✓ Salt restriction should be instituted
- ✓ Bed rest

Risk factors for heart disease in pregnancy include:

- — A positive family history of inherited cardiac disease.
- — Hypertension.
- — Obesity.
- — Increased age. greater parity, black race multiple gestation

History

- ✓ The following should be discussed at the booking clinic [past history of congenital or acquired heart disease]

Symptoms that could suggest Heart Disease:

- Severe chest pain, Pain that radiates to the neck, jaw or back,
- Agitation, vomiting, Fatigue or breathlessness,
- tachycardia, Dyspnea, tachypnoea, orthopnea
- Ankle oedema, Nocturnal cough, acidosis

Signs [especially important for women who smoke, are obese or who have hypertension]:

- ✓ murmurs
- ✓ pulmonary crackles
- ✓ elevated jugular vein pressure
- ✓ hepatomegaly

Investigations

- CXR
- EKG
- Echocardiogram
- Cardiac MRI
- Endomyocardial biopsy

Prevention

The hemodynamic strain associated with pregnancy may mask a pre-existing condition (e.g. rheumatic heart disease) or a pregnancy-associated cardiac complication may develop (e.g. cardiomyopathy). Most patients will present for the first time to obstetricians or GPs, not to cardiologists. Early diagnosis is important but can be challenging because symptoms and signs (e.g. fatigue, shortness of breath, oedema and systolic ejection murmurs) can mimic the physiological changes of pregnancy. A low threshold of referral to a cardiologist should therefore be maintained.

Women with pre-existing heart disease should have specialist preconception counseling as well as advice about the use of appropriate contraception.

High risk of maternal mortality is associated with:

- Pulmonary hypertension.
- Severely depressed systemic ventricular function (ejection fraction <30%).
- Severe left heart obstruction.
- Marfan's syndrome with ascending aorta >40 mm.
- Peripartum cardiomyopathy with residual impairment of left ventricular function.

Women with significant risk include those with:

- ✓ Cyanotic heart disease.
- ✓ Other complex congenital heart disease including Fontan's circulation (which results from a single ventricle anomaly) and systemic right ventricle (a right ventricle supporting the systemic circulation either due to congenital anomaly or surgery).
- ✓ Mechanical prosthetic valves.

R. Chorioamnionitis

Refer to OBGYN

Signs and Symptoms

— Fever, Increased maternal and/or Fetal Heart Rate, Sweating, uterus tender to touch, vaginal discharge with unusual odor

Laboratory test

— *FBC STAT*

Diagnosis

— Elevated WBC

— Signs and symptoms present

Management

✓ Refer to OBGYN and administer first dose of antibiotics.

— Recommended antibiotics:

— **Notes**

— Chorioamnionitis is a condition that can affect pregnant women in which the chorion and amnion (the membranes that surround the fetus) and the amniotic fluid (in which the fetus floats) are infected by bacteria. This can lead to infection in both the mother and fetus, and, in most cases the fetus has to be delivered as soon as possible.

S. Myoma and pregnancy

Refer to OBGYN

Diagnosis

✓ Confirmed by physical examination and ultrasound.

Management

- Emphasis on rest
- Conservative management
- Ob-gyn consultation

NOTE

— Frequently co-existent. some cases, no complications arise.

— Possible consequences/sequelae of myoma

- Infertility and Increased frequency of abortion or preterm delivery
- Compressive manifestations (on urinary tract, rectum, nerves, etc.) due to rapid growth
- Dystosic delivery
- Abnormal fetal presentations
- Fetal hypoxia
- Low placental insertion
- Abruptio placentae
- PROM
- Fetal malnutrition or death
- Pre and post delivery hemorrhage
- Obstruction of lochial flow during puerperium

— Possible repercussions of pregnancy on myoma

- Accelerated growth of tumor
- Change in form and location during pregnancy
- Degeneration
- Pedicular torsion and necrosis

T. TB during pregnancy

Refer to OBGYN

Streptomycin should not be used because it has been shown to have harmful effects on the fetus.

Information obtained from CDC

✓ Treatment of pregnant women should be initiated whenever the probability of TB is moderate to high.

Diagnosis

— Medical history- contact with suspected or known persons and or sign and symptoms of disease

— Physical examination

— Tests- initially test for the infection - skin test, if positive, chest x-ray and sputum tests to confirm if there is disease or latent infection

Notes

— Untreated tuberculosis (TB) disease represents a greater hazard to a pregnant woman and her fetus than does its treatment.

— Infants born to women with untreated TB may be of lower birth weight than those born to women without TB and, in rare circumstances the infant may be born with TB.

Although the drugs used in the initial treatment regimen for TB cross the placenta, they do not appear to have harmful effects on the fetus.

- The tuberculin skin test is considered both valid and safe to use throughout pregnancy.
- The TB blood test is safe to use during pregnancy, but has not been evaluated for diagnosing M. tuberculosis infection in pregnant women. No false positives if BCG has been administered

Referral

- ✓ Refer to obgyn/internist immediately if the confirmatory tests are positive. Treatment should be initiated immediately.
- ✓ Ensure CBC/differential, renal and hepatic function tests and HIV status are available upon referral to specialist.

Counselling

- ✓ Women who are being treated for drug-resistant TB should receive counseling concerning the risk to the fetus because of the known and unknown risks of second-line antituberculosis drugs.
- ✓ Counsel on TB pharmacologic treatment and pregnancy

Pharmacologic treatment will be guided by specialist and may include:

- Latent TB Infection (LTBI) – Isoniazid (INH) administered either **daily or twice weekly** for 9 months is the standard regimen for the treatment of LTBI in pregnant women.
- Women taking INH should also take pyridoxine (vitamin B6) supplementation.
- The **12-dose regimen** of INH and Rifapentine (RPT) is **not recommended** for pregnant women or women expecting to be pregnant within the next 3 months.
- Active TB - Pregnant women should start treatment as soon as TB is suspected. The preferred initial treatment regimen is INH, rifampin (RIF), and ethambutol (EMB) daily for 2 months, followed by INH and RIF daily, or twice weekly for 7 months (for a total of 9 months of treatment).
- In most cases, pyrazinamide (PZA) is not recommended to be used because its effect on the fetus is unknown.
- HIV and TB co-infection – HIV-infected pregnant women who are suspected of having TB disease should be treated without delay. TB treatment regimens for HIV-infected pregnant women should include a rifamycin.
- Although the routine use of PZA during pregnancy is not recommended in the United States, the benefits of a TB treatment regimen that includes PZA for HIV-infected pregnant women may outweigh the undetermined potential risks to the fetus.

Contraindications

The following antituberculosis drugs are contraindicated in pregnant women:

- Streptomycin
- Kanamycin
- Amikacin
- Capreomycin
- Fluor quinolones

TB treatment and breastfeeding

— Breastfeeding should not be discouraged for women being treated with the first-line antituberculosis drugs because the concentrations of these drugs in breast milk are too small to produce toxicity in the nursing newborn. For the same reason, drugs in breast milk are not an effective treatment for TB disease or LTBI in a nursing infant.

O. Zika and pregnancy

Evidence is now available that Zika virus causes a rare birth defect and other severe fetal abnormalities, the first of a mosquito-borne virus linked to congenital brain defects. "It is now clear, that the virus causes microcephaly" [CDC March 25 2016].

Note: These guidelines may change as evidence becomes available.

Case definitions

1. **Zika Virus disease**

Suspected case of Zika virus disease		Confirmed case of Zika virus disease
Patient with rash [itchy maculopapular] * with **two or more** of the following signs or symptoms: 1. arthralgia 2. myalgia 3. conjunctivitis (non-purulent/hyperemic) 4. fever, usually <38.5 ° C 5. peri-articular edema		Patient who meets the criteria for a suspected case **AND** has laboratory confirmation of recent Zika virus infection, i.e.: ***RNA or Zika virus antigen in serum*** [within 3 days of onset of symptoms – plain red tap tube]

2. **Congenital syndrome associated with Zika Virus**

Suspected case of congenital syndrome associated with Zika virus	Probable case of congenital syndrome associated with Zika virus	Confirmed case of congenital syndrome associated with Zika virus
Live newborn who presents with: • Microcephaly: head circumference below -2 standard deviations for gestational age and sex, measured at 24 hours post-partum according to the standardized reference; **AND** whose mother: • traveled to, or resided in, an area where Zika virus vectors were	Live newborn who meets the criteria for a suspected case of congenital syndrome associated with Zika virus **AND** • who has intracranial morphological alterations detected by	Live newborn who meets the criteria for a suspected case of congenital syndrome associated with Zika virus **AND** Zika virus infection was detected in specimens of the newborn,

present during her pregnancy; **OR** • Had unprotected sex during pregnancy with a partner who resided in, or traveled to, an area with the presence of Zika virus vectors.	any imaging method, and not explained by other known causes; **OR** • whose mother had rash during pregnancy	regardless of detection of other pathogens.

3. Zika-virus-associated abortion or stillbirth

Suspected Zika-virus-associated abortion or stillbirth Abortion or stillbirth in a woman, who during her pregnancy • presented rash **AND** • resided in or travelled to an area where Zika virus vectors were present; **OR** had unprotected sex during pregnancy with a partner who resided in or travelled to an area where Zika virus vectors were present.		Confirmed Zika-virus-associated abortion or stillbirth Suspected case in which specimens from either the mother (blood) or the abortion/ stillbirth are laboratory-positive for Zika virus.

4. Vertical transmission (without congenital syndrome)

Suspected vertical transmission (without congenital syndrome) Live newborn of any gestational age who has not met the criteria for a suspected case of congenital syndrome associated with Zika virus **AND** whose mother had a suspected, probable or confirmed case of Zika infection during pregnancy.	Probable case of vertical transmission (without congenital syndrome) Live newborn who meets the criteria for suspected vertical transmission in whom virus RNA is detected by RT-PCR in a umbilical cord blood sample.	Confirmed case of vertical transmission (without congenital syndrome) Live newborn who meets the criteria for suspected vertical transmission in whom PCR is positive.

First and subsequent contacts with pregnant women

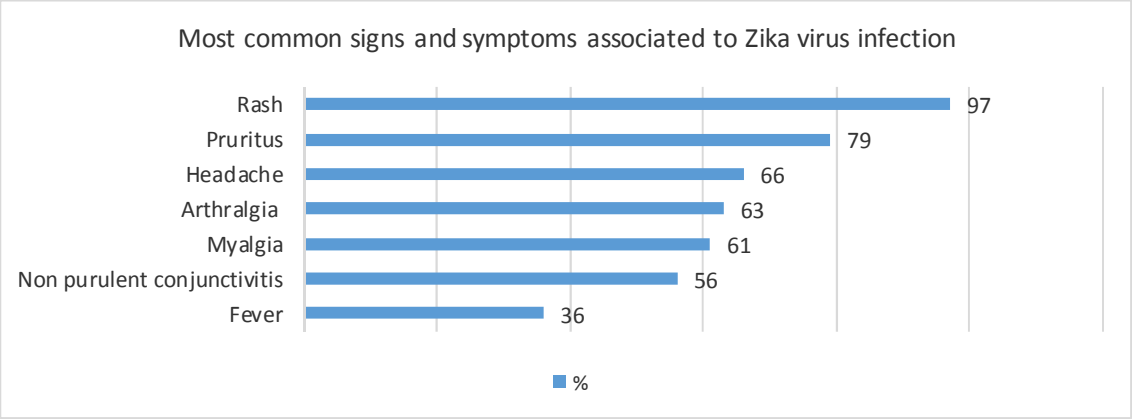
1. Document her travel history to countries with active Zika virus transmission

2. Document her spouse travel history to countries with active Zika virus transmission or relatives to determine risk of exposure or infection

3. Advise on the use of condom throughout the pregnancy, use of proper clothing, repellents, sleep under bed net day and night and use of screens at home, weekly destruction of mosquito breeding sites in and around dwellings, to protect from mosquito bites.

4. Remind women of other causes of microcephaly: alcoholic beverages, illicit drugs, and medications (unless prescribed by a health care professional)

Figure 1 Zika virus disease signs and symptoms



5. Indicate ultrasonography at 20 weeks gestation for routine check of fetus viability, confirmed EDD and early detection of changes due to Zika virus infection [microcephaly]

6. Indicate follow up ultrasound at 28 weeks gestation [Diagnostic accuracy is greater when other central nervous system defects are associated, such as encephalic micro calcification, ventricular expansion, hydrocephalus, and/or other defects including hepatomegaly, edema of the placenta, and fetal edema]

7. Discuss about potential consequences for the fetus [9]

8. Screen for signs and symptoms of Zika virus infection: [itchy maculopapular rash is one of the most distinctive symptoms of Zika virus infection]

[9] Article 16 of the United Nations Convention to Eliminate All Forms of Discrimination against Women establishes that women have "the same rights to decide freely and responsibly on the number and spacing of their children and to have access to the information, education and means to enable them to exercise these rights." Regarding access to family planning methods, article 12 of the Convention establishes that "States Parties shall take all appropriate measures to eliminate discrimination against women in the field of health care in order to ensure, on a basis of equality of men and women, access to health care services, including those related to family planning." Article 14 refers to specific measures aimed at protecting women in rural areas and establishes that the States Parties will guarantee the right of these women to "have access to adequate health care facilities, including information, counselling and services in family planning." The Convention entered into force on September 3, 1981 and has been ratified by the following countries of the Region of the Americas: Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominica, the Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Saint Lucia, Suriname, Trinidad and Tobago, Uruguay, and Venezuela.

9. Median laboratory results: leucocyte count ~4,600 cells/mm3, platelet count ~201,000 cells/mm3, and hematocrit 41.2%.

10. **Diagnosis** is based on clinical suspicion. **Suspicious case of Zika virus infection:** fill investigation form[s], collect blood sample [plain red tap tube] and send to CML who in turn will ship to CARPHA. Continue filling the copy of the investigation form [prospective data].

11. **Confirmed diagnosis [Virological]** consists of identifying the viral nucleic acid through a reverse transcription polymerase chain reaction (RT-PCR) test.

Case management of pregnant women with Zika virus infection

1. Rest and isolation: To prevent any further transmission

2. Contact between Zika-infected patients and Aedes mosquitoes should be prevented, at least during the first week of the disease (viremic phase): wearing of proper clothing [long sleeves and long trousers], see other measures to prevent mosquito bites.

3. Fever: apply physical measures (damp cloths, light clothing, baths or showers with lukewarm water). When these fail, administer pain relievers and anti-pyretics (acetaminophen or paracetamol is the first-line therapy); recommended dose: 500 mg orally every 6-8 hours; patients must be warned not to exceed 4,000 mg/day, since high doses may damage the pregnant woman's liver.

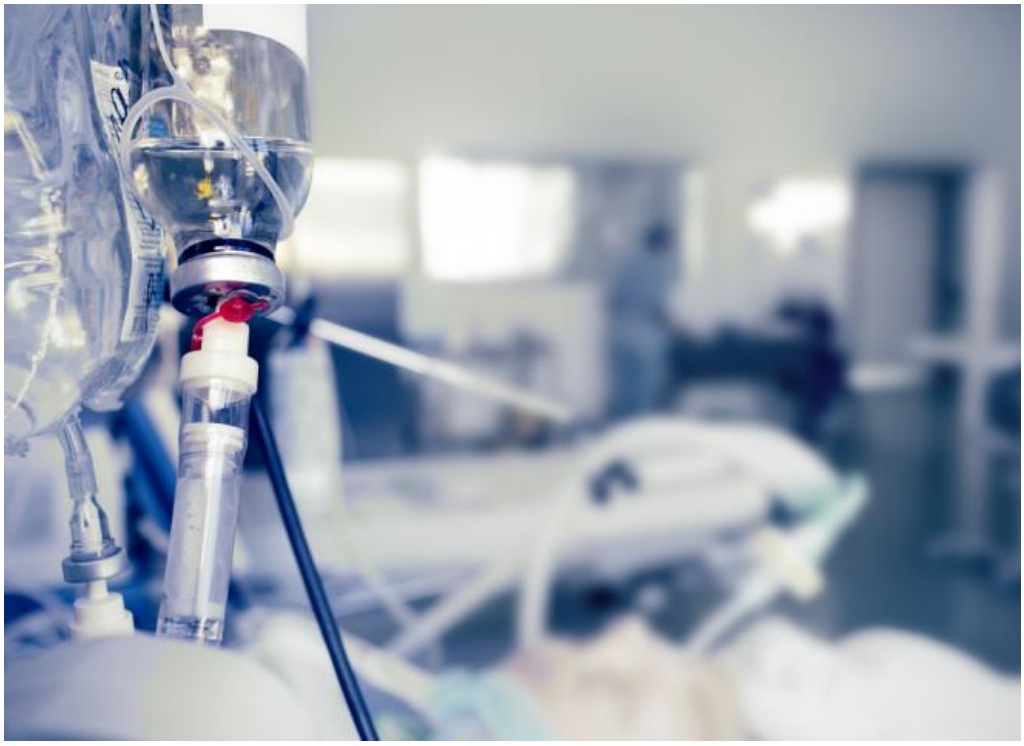
4. Topical application of calamine lotion or menthol-based aqueous creams – pruritus;

5. Counsel on ultrasonography findings compatible with congenital syndrome associated to Zika virus infection and advice on potential outcomes: pregnancy loss, microcephaly. Provide correct and timely information and allow the family to make an informed decision on continuation of the pregnancy.

6. **Hydration:** Patients should be advised to drink plenty of fluids to replenish volume depletions through sweat, vomiting, and other insensible losses

OBSTETRIC COMPLICATIONS

[10]



[10] https://www.google.com.bz/search?q=pregnant+woman+in+icu&safe=off&biw=1920&bih=959&source=lnms&tbm=isch&sa=X&sqi=2&ved=0ahUKEwiLra2Tz8PKAhUGXB4KHebHCFsQ_AUIBigB#imgrc=QCUW7Y_f95UvgM%3A

A. Abortion

Abortion is the interruption of pregnancy before completion of 22 weeks of gestation or the expulsion of a fetus weighing less than 500 grams.

Classification

- *Early abortion*, if it occurs before 12 weeks
- ***Late*** *abortion*, if it occurs between 13 and 22 weeks.

Signs and symptoms: PV bleeding.

- ✓ Conduct complete physical examination, including
  - vaginal examination (bi-manual and speculum examinations).,
  - evaluating the intensity of bleeding,
  - the presence of lacerations,
  - uterine size and adnexal masses ,
  - abdominal tenderness,
  - peritoneal size and the characteristics of the cervix.

Clinical Classification

Complete abortion

- Complete expulsion of the product.
  - ✓ Diagnosis made by interview (history of or direct visualization of the expulsion of intact gestational sac) and physical examination (well contracted uterus and closed cervical os). doubt exists, ultrasound should be ordered.

Management:

- ✓ FBC
- ✓ Blood pregnancy test
- ✓ Pelvic ultrasound (to confirm complete expulsion)
- ✓ Monitor HCG until negative (zero); may take up to 4 weeks
- ✓ Administer Rhogam to Rh negative mothers
- ✓ Refer if uncertainty exists that product has been completely removed

Threatened abortion

- ✓ Usually manifested by scanty PV bleeding. Be dark red or bright red in color and may be seen recurring during several days. Abdominal pain is often present. Examination reveals enlarged uterus and closed cervical os.

Management

- ✓ FBC
- ✓ Blood pregnancy test
- ✓ Pelvic ultrasound
- ✓ Strict bed rest (at home, once patient is stable)
- ✓ Explanation to patient and family of the possibility of loss of pregnancy

Inevitable abortion

- ✓ Transvaginal bleeding (significant bleeding) with open cervical os. Tissue expelled through vagina. Abdominal pain.

Management:

- ✓ FBC
- ✓ Blood pregnancy test
- ✓ Referral to hospital for D&C after expulsion
- ✓ Rhogam to Rh negative mothers

Incomplete abortion

- ✓ Partial expulsion of the product of conception. by PV bleeding, colicky abdominal pain and the expulsion of some tissue. internal cervical os is dilated, with some tissue present within the endocervical canal or in the vagina.

Management:

- ✓ FBC and cross matching
- ✓ Stabilization of hemodynamics
- ✓ Removal of product of conception present in the endocervical canal
- ✓ Referral for D&C
- ✓ Rhogam for Rh negative mothers

Missed abortion

- ✓ Death of the product of conception, without expulsion. is made by regression or disappearance of subjective symptoms of pregnancy and/or low fundal height for gestational age. by ultrasound.

Management:

- ✓ Ultrasound
- ✓ FBC, PT, PTT, cross match
- ✓ Referral for D&C

Septic abortion:

- ✓ Any type of abortion, complicated by an infectious process ranging from pelvic inflammatory disease to septic shock. Condition must be suspected in patients with history of recent abortion presenting with fever or any other evidence of infection.

Management:

- ✓ Monitor vital signs
- ✓ Ensure hemodynamic stability
- ✓ FBC, RFT's, electrolytes
- ✓ Ultrasound
- ✓ Cross match
- ✓ Culture of blood, products of conception and endocervix
- ✓ Referral for hospitalization as critically ill

Therapeutic Abortion

- ✓ Women have therapeutic abortions because continuing the pregnancy would cause them hardship, endanger their life or health, or because prenatal testing has shown that the fetus will be born with severe abnormalities.
- ✓ Counseling/Psychological Support to woman and family
- ✓ Consent form must be signed by woman after risks have been explained
- ✓ Three Medical Officers must sign as a legal document for the woman to have an abortion
- ✓ Refer to higher resolution

A. Ectopic Pregnancy

Refer to OBGYN upon diagnosis If complicated, stabilize patient before referral

Ectopic pregnancy is the implantation of blastocyst anywhere outside the endometrial lining of the uterine cavity.

Women in reproductive age, sexually active, with abdominal pain should have ectopic pregnancy as a differential diagnosis.

- ✓ **Perform vaginal examination STAT** to determine presence or absence of clinical signs compatible with ectopic pregnancy plus pregnancy test, and ultrasound to rule out ectopic pregnancy.
- ✓ **Perform complete physical examination to determine the presence or absence of an emergency or life threatening condition**
- ✓

Ruptured ectopic pregnancy is a complication that usually occurs in ectopic pregnancies before the 12th week of gestational age.

Table 37 Symptoms and signs of ectopic pregnancy

Un-ruptured Ectopic Pregnancy	Ruptured Ectopic Pregnancy
- irregular spotting or bleeding - nausea - swelling of breasts - bluish discoloration of vagina and cervix - softening of cervix - slight uterine enlargement - increased urinary frequency - Abdominal and pelvic pain	- Collapse and weakness - Fast, weak pulse (110 per minute or more) - Hypotension - Hypovolemia - Acute abdominal and pelvic pain - Abdominal distension- Rebound tenderness - Pallor - Distended abdomen with shifting dullness may indicate free blood. - Painful cul-de-sac examination - Culdocentesis (cul-de-sac puncture) for the ruptured ectopic pregnancy,

✓ The fallopian tube is the most common site of ectopic implantation (greater than 90%).

Table 38 Management of ectopic pregnancy

Diagnosis	Differential diagnosis	Immediate management	Postnatal MANAGEMENT
Symptoms and signs will indicate whether pregnancy has ruptured. Serum pregnancy test combined with ultrasonography.	Threatened abortion. Acute or chronic PID, Ovarian cysts (torsion or rupture) Acute appendicitis.	Start IV line – Hartmann's 500ml Collect blood for FBC, group and cross-match Insert Foley catheter Monitor V/S Maintain NPO Transport to Hospital STAT	Provide counseling and advice on prognosis for fertility Family planning counseling and provision of a contraceptive method Request FBC Correct anemia with ferrous sulfate or ferrous fumerate 60 mg by mouth daily for six months. Follow-up visit in four weeks.

B. Prolonged Labour

Refer to OBGYN

Definition: The combined first and second stage of labour is greater than 18 hours.

Diagnosis – findings

- ✓ Cervix not dilated beyond 4 cm after 8 hours of regular contractions.
- ✓ Cervical dilatation is to the right of the alert line on the partograph.
- ✓ Ineffective or no palpable contractions in the presence of cervical changes.
- ✓ During the active phase, the woman has been experiencing labour pains for 12 hours or more without delivery

General management

- ✓ Perform a **rapid evaluation** of the condition of the woman and fetus and provide supportive care
- ✓ Assess onset of uterine contractions
- ✓ Monitor for normal uterine activity (three or more contractions in 10 minutes, each lasting more than 40 seconds
- ✓ Evaluate position of fetus
- ✓ Monitor V/S
- ✓ Re-assess pelvimetry and cervical dilation
- ✓ Monitor FHR and fetal wellbeing
- ✓ Urine dipstick – ketones, protein, nitrite and leucocytes
- ✓ Start IV fluids
- ✓ Review partograph if available
- ✓ Maintain NPO
- ✓ Refer to Hospital

NOTES

- **Prolonged latent phase**
  Irregular uterine contractions accompanied by slow and gradual cervical dilation and effacement below 4 cm for longer than 20 hours in a nulliparous and 14 hours in a multipara
- **Prolonged active phase**
  Secondary arrest of cervical dilatation and descent of presenting part in presence of good contractions
- C**ontractions are inefficient** (less than three in 10 minutes, each lasting less than 40 seconds)
- inadequate uterine activity,
- cephalopelvic disproportion, obstruction, malposition or malpresentation
- **Prolonged 2nd stage**
  More than one hour in multipara and two hours in nullipara
- **Prolonged 3rd stage:**
  More than 30 minutes

C. Olygohydramnios

Refer to OBGYN

Table 39 Management of Olygohydramnios

Diagnosis	Management	Etiology
Fetal parts easily palpated Fetus appears compressed by uterine walls FH 3 cm or more below that which corresponds with gestational age Concept: Pathological reduction of amniotic fluid volume (< 500 ml in term pregnancy).	Ultrasound Evaluation of fetal wellbeing Referral to OBGYN	***Fetal causes*** Chronic fetal hypoxia IUGR Prolonged pregnancy Renal malformations PROM Chromosome abnormalities ***Maternal causes*** Placental insufficiency Arterial hypertension Antiphospholipid antibodies Connective tissue disorders DM Hypovolemia ***Medications*** Prostaglandin inhibitors (indomethacin, ibuprofen), ACEI's

D. Polyhydramnios

Refer to OBGYN

Diagnosis

- ✓ *Symptoms:* - sensation of uterine distension
- ✓ edematous inferior limbs
- ✓ Dyspnea

Physical examination: - suprapubic and inferior limb edema

- ✓ drastic increase in abdominal girth
- ✓ recent appearance of cracks in skin
- ✓ Fundal height greater than should correspond with time of amenorrhea
- ✓ abdominal tension
- ✓ difficulty identifying fetal parts
- ✓ changing fetal position
- ✓ transmission of fluid wave
- ✓ muffled fetal heart sounds
- ✓ *Complementary.* ultrasound evaluating amniotic fluid index (=24 is indicative of polyhydramnios)

Differential Diagnosis

- Erroneous calculation of GA
- Multiple pregnancies
- Macrosomic fetus
- Ascites
- Uterine tumor
- Giant ovarian cyst

Management

- ✓ Ultrasound
- ✓ Referral to OBGYN for possible hospitalization once diagnosis confirmed

Concept. Volume of amniotic fluid reaching 2000 mls or more.-, that causes discrepancy between fundal height and gestational age

Etiology [among others]

- Maternal diabetes mellitus
- GI abnormalities: esophageal atresia, duodenal atresia, facial cleft, -esophageal fistula
- Renal disorders
- Chromosomal abnormalities: Down's Syndrome, Edwards syndrome
- Neurological abnormalities: anencephaly

Classification

- *Acute polyhydramnios:* Rapid increase in fluid, between 20 and 24 weeks of gestation, repercussion on maternal health.
- *Chronic polyhydramnios:* and insidious progress, starting at 32 weeks of gestation.

E. Placenta Previa

Refer to OBGYN

- ✓ **Refer to OBGYN**
- ✓ **Subsequent prenatal care as per OBGYN recommendations**
- ✓ Recommendations
  - Marginal or Partial Placenta Previa:
    - ✓ physical activities
    - ✓ Bed rest
    - ✓ Pelvic rest (no sex, no tampons, no douching)
    - ✓ Have one unit blood donated
    - ✓ Monitor fetal movement (Kick chart)
  - Placenta Previa:
    - Prepare for delivery by Cesarean
    - Have one unit blood available

NB: Nothing should be placed in the vagina; no vaginal examination performed

If bleeding has commenced:

- ✓ Administer Ringer's Lactate 500ml IV
- ✓ FBC, cross match, urine dipstick,
- ✓ -Monitor Fetal Heart Rate
- ✓ Monitor Vital signs especially BP
- ✓ Refer STAT to Hospital

Placenta previa is a complication of pregnancy in which the placenta grows in the lowest part of the uterus and covers all or part of the opening to the cervix. It can cause antepartum hemorrhage. Is more common in women who have:

- — Abnormally developed uterus
- — or abnormal placenta
- — Many previous pregnancies
- — Multiple pregnancy (twins, triplets, etc.)
- — Scarring on the lining of the uterus, due to surgery, c-section, previous pregnancy, or abortion

Types of Placenta Previa

- Marginal or low placental implantation: The placenta extends to the edge of the cervix but does not cover it.
- Partial: The placenta covers part of the cervical opening.
- Complete: The placenta covers all of the cervical opening.

Diagnosis

- ✓ **Ultrasound during routine prenatal care or after vaginal bleeding.**

F. Preterm labour

1. Establish diagnosis
2. Initiate treatment and stabilize patient before referral to nearest hospital with OBGYN and Pediatrician
3. Refer to OBGYN

Table 40 Management of preterm labor

Definition / Diagnosis	Primary care
Definition. Uterine contraction (2 in 10 min minimum) occurring before 37 weeks gestation, with cervical changes.	✓ Provide immediate care / stabilize patient ✓ Refer to hospital for observation and/or admission ✓ Take and record Vital Signs, FHR ✓ Initiate hydration ✓ Laboratory tests. CBC and differential, urinalysis, anovaginal cultures for group B streptococcal testing, electrolytes and calcium, glycaemia if using salbutamol.
Less than 35 weeks GA - Dilation less than 3 cms (not in labour)	✓ Refer for observation and possible eventual admission
Management ***Less than 35 weeks GA - Dilation less than 3 cms*** *(preterm labour)*	✓ Refer for admission to hospital with NICU before delivery ✓ Initiate Corticosteroid therapy - Dexamethasone 6mg IM q 12 hours x 4 doses OR - Betamethasone 12mg IM q 24 hours x 2 doses ✓ Initiate tocolytics (see table below for list of absolute and relative contraindications) - Ritodrine (Miolene) - IV Infusion, 50micrograms/minute OR Intramuscular (IM) injection, 10 mg every 3-8 hours. - Magnesium Sulfate. Take and record deep reflexes and VS – Administer Bolus 4 g in 15 mins in 250 cc D5W

	- Indomethacin (Before 32 weeks GA) 100 mg rectal mg PO or 25-50 mg every 4 to 6 hours for up to 48 hours
	- Terbutaline 250 mcg SC every 20-30 minutes x 4 doses, THEN 250 mcg 3 to 4 hours total 3 doses
	- Salbutamol 5 amps (0.5 mg) in D5W at 15mcg/min
	  - Increase rate by 15 microdrop c/15 min until < 6 contractions / hr, maximum dose 45 mcg.
	  - Side effects: , hypotension, hyperglycemia, hypocalcemia, chest pain, pulmonary edema
	- Nifedipine.
	  - Initial dose: mg PO
	  - One hour later 20 mg PRN
	  - Maintenance Dose: -20 mg PO every 8 hours x 48 hours

More than 35 weeks GA	✓ Refer for admission ✓ Initiate monitoring of labor and record

Definition. Uterine contraction (2 in 10 min minimum) occurring before 37 weeks gestation, with cervical changes.

- ✓ Refer to hospital for observation and/or admission
- ✓ Take and record Vital Signs
- ✓ Take and record FHR
- ✓ Initiate hydration
- ✓ Laboratory tests. CBC and differential, urinalysis, anovaginal cultures for group B streptococcal testing, electrolytes and calcium, glycaemia if using salbutamol.

Less than 35 weeks GA - Dilation less than 3 cms (not in labour)

- ✓ Refer for observation and possible eventual admission

Less than 35 weeks GA - Dilation less than 3 cms (preterm labour)

- ✓ Refer for admission to hospital with NICU before delivery
- ✓ Initiate Corticosteroid therapy
  - ✓ Dexamethasone 6mg IM q 12 hours x 4 doses OR
  - ✓ Betamethasone 12mg IM q 24 hours x 2 doses
- ✓ Initiate tocolytics (see table below for list of absolute and relative contraindications)
  - ✓ Ritodrine (Miolene)
  - ✓ IV Infusion, 50micrograms/minute OR Intramuscular (IM) injection, 10 mg every 3-8 hours.
  - ✓ Magnesium Sulfate. Take and record deep reflexes and VS

- Bolus 4 g in 15 mins in 250 cc D5W

✓ Indomethacin (Before 32 weeks GA) 100 mg rectal mg PO or 25-50 mg every 4 to 6 hours for up to 48 hours

✓ Terbutaline250 mcg SC every 20-30 minutes x 4 doses, THEN 250 mcg 3 to 4 hours total 3 doses

✓ Salbutamol 5 amps (0.5 mg) in D5W at 15mcg/min

- Increase rate by 15 microdrop c/15 min until < 6 contractions / hr, maximum dose 45 mcg.

✓ Side effects: , hypotension, hyperglycemia, hypocalcemia, chest pain, pulmonary oedema

✓ Nifedipine.

- Initial dose: mg PO
- One hour later 20 mg PRN
- Maintenance Dose: -20 mg PO every 8 hours x 48 hours

More than 35 weeks GA

✓ Refer for admission

✓ Initiate monitoring of labour and record

G. Premature rupture of membranes (PROM)

Refer to OBGYN

1. Diagnosis of gestational age and presence of PROM
2. Classify in Preterm PROM [PPROM] or term Prom[PROM]
3. Hospitalize and initiate treatment and stabilize patient
4. Transfer PPROM to Regional hospital >35 weeks GA or national hospital <35 weeks GA in the presence of labor

Definition. Rupture of membranes before the onset of labour. The objective of the treatment is to reduce morbidity and mortality due to associated infections.

History: Report of clear or pale yellow gush of fluid from the vagina, followed by recurrent dampness and/or inability to stop urinating.

Physical exam

✓ Observation- check for evident leakage.

✓ Place vaginal pad, if leakage is gradual, over the vulva for examination (visually and by odour) one hour later.

✓ Do not perform vaginal exam unless the patient is in established labour

✓ *Laboratory diagnostics*

- ✓ Nitrazine test (positive; yellow strip turns yellow) to be carried out if test available.
- ✓ Order Ferning test to observe pattern.

✓ Refer to specialist with the following indications and initiate these when possible:

- ✓ Take and record V/S
- ✓ Take and record Fetal Heart Rate
- ✓ Placement of vaginal pad
- ✓ Ultrasound STAT to assess fetal wellbeing and amniotic fluid index
- ✓ Non stress test
- ✓ Pharmacological Treatment- [Initiate first dose when possible] erythromycin 250 mg orally every 6 hours for 10 days or until delivery
- ✓ In the presence of labor administer Penicillin G, initial dose 5 million units IV, followed by 2.5 million units IV every 4 hours orally or Ampicillin initial dose 2 g IV followed by 1g IV every 4 hours or in women allergic to penicillin, clindamycin 900 mg IV every 8 hours until delivery [at least two hours before delivery to maximize the antibiotic's prophylaxis efficacy]
- ✓ If there are signs of infection [fever, foul odor vaginal secretion] treat as amnionitis, continuing antibiotics until delivery: ampicillin 2 g IV c/6 hours + gentamycin 5mg/kg bodyweight IV every 24 hours.

Antenatal corticosteroid therapy (26 to 35 weeks GA)

- ✓ Dexamethasone 6mg IM q 12 hours x 4 doses OR
- ✓ Betamethasone 12mg IM q 24 hours x 2 doses
- ✓ Document on CLAP Form and BHIS corticosteroids administered

Antibiotic therapy

- ✓ Expectant management - Ampicillin 2g IV q 6 hours in 48 hours
- ✓ Prophylaxis during delivery – If PROM > 18 hours

Table 41 Antimicrobial options – PROM

Option 1 Prophylactic penicillin G 2 million units IV every six hours until delivery;	**OR**	Ampicillin 2 g IV every six hours until delivery
Option 2 If have penicillin allergy use IV Cefazolin (2 g then 1 g every 8 hours)		– Erythromycin 500mg IV every 6 hours – Clindamycin 900mg IV every 8 hours – Vancomycin 1g every 12 hours.

✓ Indicate CBC and differential, CRP, anovaginal cultures for group B streptococcus, if not performed within 6 weeks prior.

Management

Expeditious Delivery

- ✓ PROM beyond 34 weeks GA

Presence of PROM and intrauterine infection, abruptio placentae, repetitive FHR decelerations, cord prolapse or active labour.

- ✓ *Expectant management*

PROM > 34 weeks without any criterion for expeditious delivery

- ✓ refer to OBGYN

PROM 23 – 24 weeks GA –

- ✓ expectant management at home in case of a stable pregnancy

PROM 24 – 33 weeks GA –

- ✓ expectant management in hospital with close fetal monitoring

H. Normal labor

Definition. Uterine contraction (2 in 10 minutes minimum) occuring after 37 wks gestation, with cervical changes. Determine at what time labor pain got regular.

- ✓ Suspect or anticipated labor if there is Intermittent abdominal pain after 22 weeks gestation
- ✓ Abdominal pain often associated with blood-stained mucus discharge (show)
- ✓ watery vaginal discharge or a sudden gush of water
- ✓ Cervical effacement – the progressive shortening and thinning of the cervix during labour
- ✓ cervical dilatation – the increase in diameter of the cervical opening measured in centimeters
- ✓ rapid evaluation is to be performed by the attending Doctor/Nurse/Nurse Midwife
    - — physical examination
    - — Vital signs
    - — Abdominal palpation
    - — VE (if called for)
    - — Any abnormal finding take measures as per protocol

- ✓ Assess fetal condition
    - ✓ listen to fetal heart rate before, during, and immediately after a contraction

- ✓ frequency of checking fetal heart rate
  - — First stage [latent <4cms]: every hour
  - — First stage [active 5-9cms]: every 30 minutes
  - — Second stage with no complication [10 cms –delivery]: every 15 min
  - — Second stage with complications [10 cms –delivery]: every 5 minutes
- ✓ Ensure compliance to companion at birth policy
- ✓ Ensure good communication with patient and relatives
- ✓ Ensure to support the client throughout the labor and delivery process
- ✓ Maintain cleanliness of the woman and her environment
- ✓ Ensure mobility
- ✓ Allow patient to have liquid diet (if NPO; provide patient with IV therapy)
- ✓ Monitor progress of labor using the partograph and as per protocol

j. Post-term Pregnancy

Refer to OBGYN

Definition: Pregnancy that extends to 42 weeks and beyond (more than 294 days after the first day of the last period)

Diagnosis: Diagnostic aides for the estimation of overdue EDD

- ✓ Proper calculation of GA and EDD by LMP (if reliable)
- ✓ EDD improved by USG, especially when done during the 1st trimester, when the LMP is not reliable. margin of error given by the USG for each trimester of pregnancy is as follows:
  - — Crown – rump length 3-5 days
  - — 12 – 20 weeks 7-10 days
  - — 20 – 30 weeks 2 weeks
  - — Beyond 30 weeks 3 weeks

If the calculated Ultrasonography GA varies from the LMP by more than the respective range of error above, use the US to establish the EDD

- ✓ Positive HCG serum: More than 36 weeks since a positive HCG serum positive test
- ✓ Fetal Heart Tones: More than 20 weeks of fetal heart tones established by Pinard's fetoscope or more than 28 weeks by Doppler fetoscope
- ✓ Other factors to take into consideration when establishing a diagnosis of post-term pregnancy:

(i) History of previous prolonged pregnancy(ies) and other risk factors for term pregnancies, including, primiparity, male fetus, congenital abnormalities the fetus and obesity

(ii) patient is eumenorrheic or not

(iii) Correlation between GA and first VE

(iv) Correlation between fundal height and GA calculated at 20 weeks

(v) Fetal movements first perceived by primipara between 18 and 20 weeks and by multiparas between 16 and 20 weeks

Health Education

- ✓ Emphasize that at 41 weeks of GA, irrespective of the absence of signs and symptoms of labour, every mother must go to her health care provider

Prevention *of post term pregnancy:*

- ✓ Membrane stripping between 39 and 40 weeks (OBGYN)
- ✓ Nipple stimulation **after 39 weeks**

Impending *post-term pregnancy (> 40 but < 42 weeks gestation)*

- ✓ Indicate and conduct when possible:
  - USG to estimate fetal weight, nuchal chord, malpresentation, amniotic fluid index other findings.
  - Take and record FHR
  - NST
  - Pelvimetry (OBGYN)
- ✓ Attach results of relevant tests on referral form to OBGYN to optimize care for both specialist and client and:
  - From - 41 weeks: Request appointment with OBGYN
  - After 41 0/7 weeks: **Referral to OBGYN** for **Admission**

K. Endometritis

Refer to OBGYN

Endometritis is an inflammation or irritation of the lining of the uterus (the endometrium). Although potentially serious, it affects as many as 30 percent of women after a cesarean birth and as many as 3 percent of women after giving birth vaginally.

Signs and Symptoms

- Abdominal pain
- Temp > 38°C on 3rd or 4th day of puerperium
- Tachycardia and chills
- Thick, fetid purulent-looking lochia
- Heavy vaginal bleeding

Cause. Objects inserted into the vaginal canal during labor or during a cesarean increase the odds of a uterine infection.

Types. There are two types of uterine infections after birth:

- Early onset begins within three days of birth
- Late onset occurs anytime between three days to six weeks after birth.

Treatment

Early onset

- ✓ Refer to hospital urgently
- ✓ Administer first dose antibiotics IV

Late onset Endometritis (>72 hours postpartum)

- ✓ Erythromycin 500 mg PO qid for 7 days
- ✓ Doxycycline 100 mg PO bid (Do not use if lactating)
- ✓ Monitor vital signs
- ✓ Administer analgesics
- ✓ Stress importance of adequate hygiene
- ✓ Vaginal Swab for microbiology

Follow-up: if symptoms persists after 48 hours refer to hospital for admission for intravenous antibiotic therapy

L. Pregnancy and mental health disorders

Refer to PNP and OBGYN

70-80% of women with maternal mental disorders can be successfully treated and recover!

- ✓ Doctors and nurses and PNP's can identify women with mental disorders, treat and refer based on needs.
- ✓ Screen pregnant women for mental disorders e.g. depression, anxiety, psychosis.
- ✓ Simple questions asked during pregnancy and in the postpartum period may help to identify women at greater risk for mental disorders, for instance:
    - Depression: "How much of the time during the last month have you felt down hearted and blue?";
    - Anxiety: "How much of the time during the last month have you been a very nervous person?";
    - Psychosis: "Have you been receiving any special messages from people or from the way things are arranged around you?"
- ✓ Screen among those at greater risk: poverty, migration, extreme stress, exposure to violence [domestic, sexual, among others, usually from intimate partner or ex partner], emergency and conflict situations, natural disasters and poor social support.
- ✓ Screen for related behaviors that may affect mother and fetus: less likely to eat and sleep well, inadequate weight gain, incomplete prenatal care, fail to plan and/or seek help for the birth, use of harmful substances [alcohol, tobacco and other drugs,] and suicidal attempts.
- ✓ Screen for health effects on both mother and fetus due to increased stress hormones: hypertension, preeclampsia, early and difficult delivery, small for gestational age newborn.
- ✓ After birth, look for the following signs: difficulty going to sleep, or sleeping too much, lack of interest in usual activities or pastimes, feelings of guilt, loss of energy, difficulty concentrating or making decisions, changes in appetite or eating, feeling tired all time, thoughts of suicide or death, physical violence and death of the child, personal or family history of depression, an undesired or unplanned pregnancy, marital or financial problems, significant life changes, such as the death of a relative or a change of jobs, medical problems, or complications with the pregnancy, miscarriage in a previous pregnancy.
- ✓ The common antidepressants for postpartum use are the selective serotonin inhibitors such as sertraline, paroxetine, citalopram and fluoxetine. If the mother is breastfeeding, sertraline chlorhydrate in a dose of 50mg/day orally is the drug of choice, since it passes through to the milk in lower quantities.

Postnatal period

[11]

[11] https://www.google.com.bz/search?q=pregnant+woman+in+icu&safe=off&biw=1920&bih=959&source=lnms&tbm=isch&sa=X&sqi=2&ved=0ahUKEwiLra2Tz8PKAhUGXB4KHebHCFsQ_AUIBigB#safe=off&tbm=isch&q=baby+with+mother+and+father+icons&imgrc=S9FxPqBeuXkiyM%3A

A. Post partum hemorrhage

severe postpartum, refer to OBGYN immediately

Definition: Excessive loss of blood = 500 mls after vaginal birth or = 1000 mls after Cesarean Section.

Signs and symptoms: Lightheadedness, vertigo, syncope, hypotension, and oliguria (signs and symptoms of ranging from hypovolemia to hemorrhagic shock)

Classification

- *Primary* or *early* – occurs within 24 hours after delivery.
- *Secondary* or *late* – occurs 24 hours to 12 weeks after delivery.

Diagnosis is based on history, signs and symptoms.

General Measures:

- ✓ Immediate notification to most experienced staff, urgent referral to hospital once stabilization procedures are completed.
- ✓ Obtain I.V. access with 16 – 18 G catheters. : Ringer's Lactate 500mls IV to be given within a time period to be determined by hemodynamic status.
- ✓ Take and record vital signs.
- ✓ Administer first dose of uterotonics where available
- ✓ Inspect the entire birth canal from perineum to cervix for significant lacerations and repair cervical or vaginal lacerations.
- ✓ Assess uterine defects and tone:
  - o if not contracted, apply uterine massage or other methods e.g. tamponade
  - o Suture cervical laceration
  - o uterine rupture or dehiscence, tamponade,
  - o Remove retained products of conception
  - o Re-examine placenta if applicable
- ✓ Laboratory examinations: obtain blood specimen (red and purple) for baseline CBC, PT, PTT, group and cross match, renal function tests.

Pharmacologic and Medical treatment:

Primary PPH

Uterotonic drugs only if the uterus is atonic

- Oxytocin: 20 – 40 units in 500ml of normal saline IV or 10 units IM. If response is not adequate,
- Methylergonovine: 0.2 mg IM, if no hypertension, Raynaud's phenomenon, or scleroderma. repeat at 2 – 4 hour intervals. response is not adequate,
- Misoprostol (Cytotec): 800mcg in rectum if needed.

Analgesics Type and use will depend on hemodynamic status and planned interventions.

Secondary PPH

Uterotonic drugs only if the uterus is atonic

- Oxytocin 20 – 40 units in 500ml of normal saline IV or 10 units IM. If response is not adequate,
- Methylergonovine – 0.2 mg IM, if no hypertension, Raynaud's phenomenon, or scleroderma. repeat at 2 – 4 hour intervals.

Analgesics Type and use will depend on hemodynamic status and planned interventions

Antibiotics. If bleeding is not massive, and there is fever, uterine tenderness, or a foul-smelling discharge, then endometritis should be suspected and broad spectrum antibiotic therapy should be given.

B. Puerperal sepsis

Steps before referring to OBGYN		
Screen and diagnosis	Treatment and laboratory follow up,	Immediate referral for critically ill patients No improvement, Refer to OBGYN for further evaluation and management

- ✓ Initiate Stabilization procedures and administer first doses of antibiotics when possible (see below)
- ✓ Take and record vital signs
- ✓ Place I.V. catheter 16 – 18 g
- ✓ Refer to hospital

Treatment

- ✓ IV Penicillin (crystalline), 3 million units q hours **or** IV Ampicillin 1 gram q 6 hours
- ✓ IV Clindamycin 600mg q 6 hours
- ✓ IV Amikacin 15mg/kg/day
- ✓ IV Oxytocin 30 units to be administered 10 units in 500cc Ringer's Lactate q 8 hours x 24 hours. *Do not indicate for wound or episiotomy infections.*
- ✓ IM Tetanus Toxoid, 0.5 ml if not previously received according to protocol

Wound Care

- ✓ Suture removal where necessary
- ✓ Wound cleaning and dressing BID

Laboratory examinations

- ✓ Obtain blood specimen (red and purple) for CBC with differential, cross match, serum Creatinine, urinalysis, gram stain and culture of secretions

Other Procedures

- ✓ Pelvic ultrasound in cases of endometritis

Management of complicated infections

General Measures

- ✓ Take and record vital signs q 2 – 4 hours
- ✓ Indicate Central Line placement

Laboratory indications

- ✓ Obtain blood specimen (red and purple) for differential, Cross Match
  - — **Hemoculture**
  - — **Blood smear**
  - — Serum Creatinine
  - — **Urinalysis**
  - — **Gram stain and culture secretions**
  - — **PT, PTT, fibrinogen**
  - — **Arterial gasometry**

Other procedures

- ✓ Abdominal X-Ray

Notes:

Definition. Infection caused by invasion of the genital tract by microorganisms during .

Diagnosis. History and signs and symptoms compatible with puerperal sepsis. Include fever, pain localized to site of intervention or genitalia, purulent secretion, erythema, etc.

Complications. Anaemia, deep pelvic infection (parametritis, peritonitis), wound dehiscence, pelvic septic thrombophlebitis (septic emboli), renal insufficiency, septic shock, DIC and death.

C. Infection of the surgically planned/unplanned incision on the perineum and the posterior vaginal wall.

Severe infections, refer to OBGYN

Diagnosis. Personal history and physical exam

Signs and Symptoms

- Fever
- Localized pain at site of incision
- Purulent secretion/fetid odor from episiotomy site
- Erythema

Complications. Anaemia, (Deep pelvic infection) Parametritis, Peritonitis, Wound dehiscence, Pelvic Septic Thrombophlebitis, Renal Insufficiency, Septic shock, DIC and death.

Management

- ✓ FBC stat
- ✓ Stress personal hygienic measures
- ✓ Antibiotics po daily Clindamycin 300mg q8h for 7 days OR
- ✓ Amoxicillin 500mg po q8h for 7 days
- ✓ Incision swab for C/S
- ✓ Monitor V/S for fever
- ✓ IM DT, 0.5 ml if not previously received

Follow up

After 72 hours if signs and symptoms persist:

- ✓ Refer to Hospital for IV Antibiotic
- ✓ Place I.V. catheter 16 – 18 g
- ✓ MO administer first dose antibiotic (see below)
- ✓ Take and record vital signs
- ✓ <u>Stat antibiotic to be administered by MO before referral</u>
    - IV Penicillin (crystalline), 3 million units q hours or IV Ampicillin 1 gram q 6 hours
    - IV Clindamycin 600mg q 6 hours
    - IV Amikacin 15mg/kg/day

D. Mastitis

Refer severe cases to OBGYN

Occurs following leakage of milk into the surrounding tissue as a result of a blockage or obstruction in a duct. It may occur before the end of the second week of breastfeeding but may also occur around the sixth postpartum week.

Signs and Symptoms

- Chills
- Fever
- Headache
- Pain or redness to affected breast
- Shooting pains in breast especially after nursing

Complication

- Breast Abscess

Management

- ✓ FBC stat
- ✓ Alternate warm and cold compresses on the breast
- ✓ Gently massage the area of the breast
- ✓ Encourage frequent breast feed on the affected side
- ✓ Increase fluid intake.
- ✓ Monitor V/S for fever
- ✓ Avoid sleeping on the stomach or so far over on the side that the breasts are compressed against the mattress.
- ✓ Antibiotics po daily Clindamycin 300mg q8h for 7 days OR
- ✓ Amoxicillin 500mg po q8h for 7 days

E. Infected Episiotomy/Perineal Laceration

Refer severe cases to OBGYN

- ✓ FBC stat
- ✓ Stress personal hygienic measures
- ✓ Antibiotics PO daily Clindamycin 300mg q8h for 7 days OR
- ✓ Amoxicillin 500mg PO q8h for 7 days
- ✓ Acetaminophen 500mg PO c/8 hours x 7 days

- ✓ Incision swab for C/S
- ✓ Monitor V/S for fever
- ✓ IM DT, 0.5 ml if not previously received

Follow up

- ✓ Daily follow up by Community Health Worker
- ✓ After 72 hours if signs and symptoms persist:
  - Refer to Hospital for IV Antibiotic
  - Place I.V. catheter 16 – 18 g
  - Take and record vital signs
  - MO administer first dose antibiotic (see below)
- ✓ Stat antibiotic to be administered by MO before referral
  - IV Penicillin (crystalline), 3 million units q hours **or** IV Ampicillin 1 gram q 6 hours
  - IV Clindamycin 600mg q 6 hours
  - IV Amikacin 15mg/kg/day

Notes

- **Infected Episiotomy/Perineal Laceration.** Infection of the surgically planned/unplanned incision on the perineum and the posterior vaginal wall.
  Diagnosis. Personal history and physical exam

  Signs and Symptoms
  - Fever
  - Localized pain at site of incision
  - Purulent secretion/fetid odor from episiotomy site
  - Erythema

  Complications. Anaemia, (Deep pelvic infection) Parametritis, Peritonitis, Wound dehiscence, Pelvic Septic Thrombophlebitis, Renal Insufficiency, Septic shock, DIC and death.

P. Wound Infection (Cesarean Section)

Refer to OBGYN

- ✓ Immediate referral to nearest Regional Hospital
- ✓ Stabilize patient before referral if required
- ✓ Provide first dose of antibiotic

Diagnosis. Personal history and physical exam

Signs and Symptoms

- Fever
- Localized pain at site of incision
- Purulent secretion from incisional site
- Erythema

Complications. Anaemia, (Deep pelvic infection) Parametritis, Peritonitis, Wound dehiscence, Pelvic Septic Thrombophlebitis, Renal Insufficiency, Septic shock, DIC and death.

Q. Post partum depression

Refer to PNP and OBGYN

1. Screen for postnatal distress
2. Postnatal mothers with postnatal distress, screen with the Edinburgh Postnatal Depression Scale
3. If postnatal depression is confirmed, refer to PNP for treatment and follow up

The Six Stages and symptoms of Postnatal Depression – examples of expression

1. **Denial**: "This must be what new motherhood is like. I'll be alright. It can't be postpartum depression, because I'm not mentally ill. I'm sure it will wear off soon. I just need more sleep".

2. **Anger**: "Nobody understands what I'm going through. Why me?! This is supposed to be a time of joy. I don't deserve this. I don't want to have to take medication. I don't want to go to therapy. I shouldn't have to call a doctor. This is not fair."

3. **Brain Fog:** For many of us, our brains just don't work as well when we have postpartum depression and anxiety. We have a hard time remembering things, thinking of the right words—or any words for that matter. We can't multitask as well as we used to. During my bout with postpartum OCD, I used to drive through stop signs, finding myself out in the middle of an intersection before I realized I hadn't stopped. If your mind is cloudy and you feel like you've lost at least 20 IQ points since you had your baby, you're not alone.

4. **Scary Thoughts:** Most people think they're in full control of their thoughts. I know I had no idea whatsoever that your mind could think a thought you didn't want it to. Then I got introduced to intrusive thoughts, which are scary thoughts that enter your mind that you don't want that are very upsetting but continue to plague you. Often they start with the phrase "what if," as in what if I did this terrible thing or what if that awful thing happened? It's like walking around having mini-nightmares all the time. Intrusive

thoughts are a sign of postpartum anxiety and OCD, and NO, they do not mean you've turned into some horrible monster.

5. **Numbness**: If you think women with postpartum depression are full of strong emotions, sad, and crying all the time, and instead you feel nothing whatsoever, you may be surprised. Some of you tell me that you feel only emptiness. You are just going through the motions, doing the things you know you are supposed to do but not really feeling it inside. If you are disconnected from things you used to care about and it feels as if you are hovering over your life looking down on it but no longer part of it, it's worth talking to your doctor. This is not what new motherhood is supposed to feel like.

6. **Insomnia**: Sleep when the baby sleeps, they say. But what if you can't? It's pretty shocking for a new mom who has never been more exhausted in her life to be unable to sleep. You keep thinking that eventually you'll just crash, but you don't. Or you fall asleep fine but then you wake up and can't go back to sleep. All new moms are tired, but not being able to sleep when you have the opportunity to can be a sign of postpartum depression or anxiety.

7. **Physical symptoms**: Most women expect postpartum depression to impact their mind only—how they are feeling. But for some of you, PPD manifests as physical symptoms. I hear from new moms who are suffering with headaches, back aches, upset stomachs, nausea, or even panic attacks that make them feel as though they are having a heart attack. If you are suddenly plagued by aches and pains that don't appear to be caused by the flu or food poisoning or any other illness, they may be symptoms of postpartum depression.

8. **Bargaining**: "If I just exercise more and eat better I'll be fine. If I take vitamins. If I could just get to the point where the baby sleeps through the night, I'll be okay. If I get closer to God and pray more, this will surely go away. I just need to work harder."

9. **Depression**: "I should just leave my family. I'm bringing everyone down. They all would be better off without me. My poor baby doesn't deserve a mother like this. I'll never get better so there's no point in going on."

10. **Acceptance**: "What's happening to me isn't normal and I can't ignore it anymore. It's not my fault. It is okay for me to talk to a doctor. It's okay for me to ask for help. I can take medication or go to therapy or do whatever is necessary for my health and that of my family. Postpartum depression and anxiety are temporary and treatable with professional help."

11. **PTSD – Post traumatic stress disorder**: "I still worry that PPD will return. I'm constantly looking over my shoulder. Every time I feel bad I'm convinced that I've gone back there. I feel like I've lost a lot of confidence in myself and I don't know if I'll ever get it back. I worry I hurt my child in the long-term because of how I was when he was a baby."

Other conditions

A. Deep Vein Thrombosis

Refer to OBGYN

Deep vein thrombosis is a blood clot that forms in a deep vein e.g. in the legs. In pregnant women Deep vein thromboses results from the compression of the veins due to the gravid uterus.

Pre existing risk factors

- Thrombophilia
- Auto immune disorders such as lupus

Other Risk Factors

- greater than 3 children
- greater than 35 years
- varicose veins
- greater than 180 lbs
- Intestinal diseases
- Syndrome diseases, thrombocytopenia, hemoglobinuria, nocturnal paroxysm, polycythemia
- use of oral contraceptives for long periods of time
- twins or more

Post partum Risk factors

- Greater than 35 years
- Weight greater than 180 lbs (81 Kg) or BMI > 30 Kg/m2.
- Parity greater than 3.
- Emergency C- Sections.
- Eclampsia.

Symptoms

- Red skin color (redness) that feels warm to touch
- Pain

Diagnosis

- Ultra sound of the leg.

- Antithrombin III,
- Complete blood count,
- Antiphospholipid count,
- Protein C and S levels
- Lupus anticoagulant.

Management

- ✓ Wear tight compression stockings during and after DVT
- ✓ Treat with anticoagulant during the rest of the pregnancy and at least six weeks after birth.
- ✓ Ceased smoking
- ✓ Stop aspirin use
- ✓ Avoid prolonged surgical procedures
- ✓ Move/ exercise the legs often
- ✓ Prophylactic antibiotics

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