Republic of Rwanda
Ministry of Health

Rwanda Biomedical Centre
Healthy People, Wealthy Nation

# NATIONAL ANTENATAL CARE GUIDELINES

2020

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# Foreword

According to WHO Statistics (February 2018), roughly 303 000 women died during and following pregnancy and childbirth. Almost all these deaths occurred in low-resource settings, and most could have been prevented.

Many women are dying from preventable causes for which highly effective interventions are known. The most common causes of maternal death are hemorrhage, infection, unsafe abortion, eclampsia (very high blood pressure leading to seizures) and obstructed labor.

Although Rwanda has seen impressive achievements in maternal and child health (MCH), the figures for maternal mortality remain quite high; the maternal mortality ratio decreased from 1,071 per 100,000 live births to 476 in 2010 and to 210 in 2015; this reduction is mainly explained by the increased number of women attended by a qualified health care provider. The percentage of delivery assisted by skilled provider has risen from 39% in 2005, 69% in 2010 to 91% in 2015.

This ANC guideline was developed with contributions from MOH partners and stakeholders under the leadership of Maternal, Child and Community Health Division within Rwanda Biomedical Centre. Consultations included the University of Rwanda and General Directors of health districts.

These guidelines aim to put women at the center of care, enhancing their experience of pregnancy and ensuring that babies have the best possible start in life.

We sincerely hope that these guidelines will help service providers at all levels of the health system to use evidence-based knowledge and skills to deliver quality antenatal care and this will certainly contribute to improve maternal and perinatal outcomes.


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**Minister of Health**

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Finally, special thanks to all members of RMNCAH Technical Working Group and subgroups for active participation and the Maternal, Child and Community Health Division within Rwanda Biomedical Center for the coordination in development of these guidelines.


**Dr Sabin NSANZIMANA**
**Director General RBC**

## Acronyms

| | | |
|---|---|---|
| ANC | : | Antenatal Care |
| ASB | : | Asymptomatic Bacteriuria |
| ASM | : | Agent de Santé Maternelle (Community Health Worker in Charge of maternal health) |
| CHW | : | Community Health Worker |
| CMIS | : | Clinic Management Information System |
| DHIS | : | District Health Information System |
| EMTCT | : | Elimination of Mother-to-child transmission of HIV |
| EIMC | : | Early Infant Male Circumcision |
| FANC | : | Focused Antenatal Care |
| FAO | : | Food and Agriculture Organization of the United Nations |
| FHR | : | Fetal Heart Rate |
| DGD | : | Guideline Development Group |
| GDM | : | Gestational diabetes mellitus |
| Hb | : | Hemoglobin |
| HIV | : | Human Immunodeficiency Virus |
| HMIS | : | Health Management Information System |
| HP | : | Health Post |
| HTSP | : | Healthy Timing and Spacing of Pregnancy |
| IPV | : | Intimate Partner Violence |
| LLIN | : | Long Lasting Insecticidal Nets |
| MUAC | : | Mid-upper arm circumference |
| NCD | : | Non-Communicable Diseases |
| NRH/UTH | : | National Referral Hospital/University Teaching Hospital |
| PITC | : | Provider Initiated Testing and Counseling |
| PLA | : | Participatory learning and action |
| PrEp | : | Pre-Exposure prophylaxis for HIV |
| RBC | : | Rwanda Biomedical Center |

SBP : Systolic Blood Pressure

SFH : Symphysis-fundal height

STI : Sexually Transmitted Infections

TB : Tuberculosis

VMMC : Voluntary Medical Male Circumcision

WHO : World Health Organization

# CHAPTER I. BACKGROUND

The Global Strategy for Women's children's and adolescents' health (2016-2030) has the vision to have by 2030 a world in which every woman, child and adolescent in every setting realizes their rights to physical and mental health and well-being, has social and economic opportunities and is able to participate fully in shaping prosperous and sustainable societies[1].

By ending preventable deaths of women, children and adolescents, we can significantly improve their health and well-being. Complications of pregnancy and childbirth, unwanted pregnancies and lack of access to or use of quality health –care services and life-saving commodities are among causes of preventable deaths[1].

The fourth health sector strategic plan (HSSP4) highlights Rwanda commitments and priorities for the coming 6 years and it is fully integrated in the overall economic development plan of the Government. HSSP4 fulfills the country's commitment expressed in the national constitution, National Strategy for Transformation (NST) and the aspiration of the Health Sector Policy 2015. HSSP4 Strategies adhere to the Universal Health Coverage (UHC) principles towards realization of the Sustainable Development Goals (SDGs)[2].

All strategic interventions highlighted in HSSP IV were guided by three values and guiding principles that orient and underlie the provision of health services: people-centered services, integrated services and sustainable services.

## 1.1 Situation Analysis

Although Rwanda has seen impressive achievements in maternal and neonatal health indicators, the figures for maternal and neonatal mortality remain quite high; a lot still needs to be done to achieve SDG targets. Most deaths of under-5s occur in the neonatal period and more than 65% of deaths in the first year of life. Forty-one percent of neonatal deaths are caused by preterm birth complications followed by birth asphyxia (33 percent). Ninety four percent of the neonatal deaths occur within the first week of life. Of these, 62 percent are deaths at birth[3].

Although 99% of Rwandan mothers received antenatal care, only 44% of women who had a live birth in the five years preceding the survey met the standard of at least four antenatal care (ANC) visits[3]. However, this proportion represents an increase from 13% in 2005 and 35% in 2010[4]. It

should be noted that ANC is also an opportunity to provide nutritional counseling for the pregnant woman and stunting remains a public health concern in Rwanda where 38% of children under age 5 are stunted (DHS 2014-2015) and we should keep in mind that stunting starts during pregnancy.

ANC is an opportunity to identify and prevent many complications in pregnancy, childbirth and postpartum period. As an example of this, ANC helps to identify and prevent low birth weight babies and stunting at a later stage. This is a public health concern in Rwanda where 38% of children under age 5 are stunted (DHS 2014-2015).

### Table .1: Key maternal, neonatal and child health indicators

| **Key Health Indicators**[3] | **RDHS 2005** | **RDHS 2010** | **RDHS 2015** | **Targets** |
|---|---|---|---|---|
| Neonatal mortality (per 1,000 live births) | 37 | 27 | 20 | SDG 3.2: 12<br>•As low as 12 per 1000 live |
| Infant mortality (per 1,000 live births) | 86 | 50 | 32 | SDG 3.2: end preventable deaths |
| Under-five mortality | | 76 | 50 | SDG 3.2:<br>• As low as 25 per 1000 live births<br>•As low as 25 per 1000 live |
| Maternal mortality (per 100,000 live births) | 750 | 476 | 210 | <70 (SDG) |
| Proportion of women 15-49 years with thinness (BMI<18.5 kg/m2) | 11.5 | 7.3 | 6.6 | |
| Proportion of women 15-49 years overweight (BMI>=25 kg/m2) | 9.8 | 16.3 | 20.8 | |
| Proportion of children under five stunted (% weight for height/length <-2SD) | 51 | 44 | 38 | Global target (WHO): 40% reduction (2012-20252025) |
| Proportion of Low birth weight | N/A (68% of birth with no record of weight) | N/A (67.8% of birth with no record of | 6.3 (92.2% of birth with a reported | Global target (WHO): 30% reduction (2012-2025) |
| Percentage of delivery assisted by skilled provider | 39 | 69 | 91 | >90% (Rwanda HSSP 2018-2024) |

## 1.2 Rationale for ANC Guidelines

The purpose of this guideline is to assist health providers to deliver quality antenatal care to pregnant women and ensure that all pregnant women and adolescent girls receive ANC beginning early as possible and continuing throughout their pregnancy. This national ANC guideline aims to promote a consistent, efficient and evidence-based approach to the provision of antenatal care and to protect the health of women and their newborn so as to achieve at the end of a pregnancy a health mother and a healthy baby, with a positive pregnancy experience, including maternal self-esteem, competence and autonomy. The Guideline Development Group (GDG) for the new WHO ANC model with eight (8) contacts has emphasized the evidence indicating increased fetal deaths and lesser satisfaction of women with the four-visit model (also known as focused or basic ANC). Evidence suggests that more ANC visits, irrespective of the resource setting, are probably associated with greater maternal satisfaction than less ANC visits.

The GDG prefers the word "contact" to "visit", as it implies an active connection between a pregnant woman and a health-care provider that is not implicit with the word "visit". In terms of the operationalization of this recommendation, "contact" can be adapted to local contexts through community outreach programs and lay health worker involvement[5].

This national ANC guideline doesn't replace other guidelines, especially those related to management of clinical conditions.

The overarching principles of this guideline aimed to prioritize prevention, ensure access to prevention and treatment services, respect women's autonomy, provide comprehensive care, and safeguard against discrimination and stigmatization.

The implementation of this guideline requires a strong health system to ensure that quality and equitable ANC services are provided at all levels of the health system. This guideline is in line with the latest WHO guideline. The core package for Rwanda has been defined and contextualized based on evidence especially with respect to the context specific recommendations proffered in the WHO 2016 ANC recommendations. It is expected that the correct use of this guideline will help reduce maternal and perinatal mortality and morbidity.

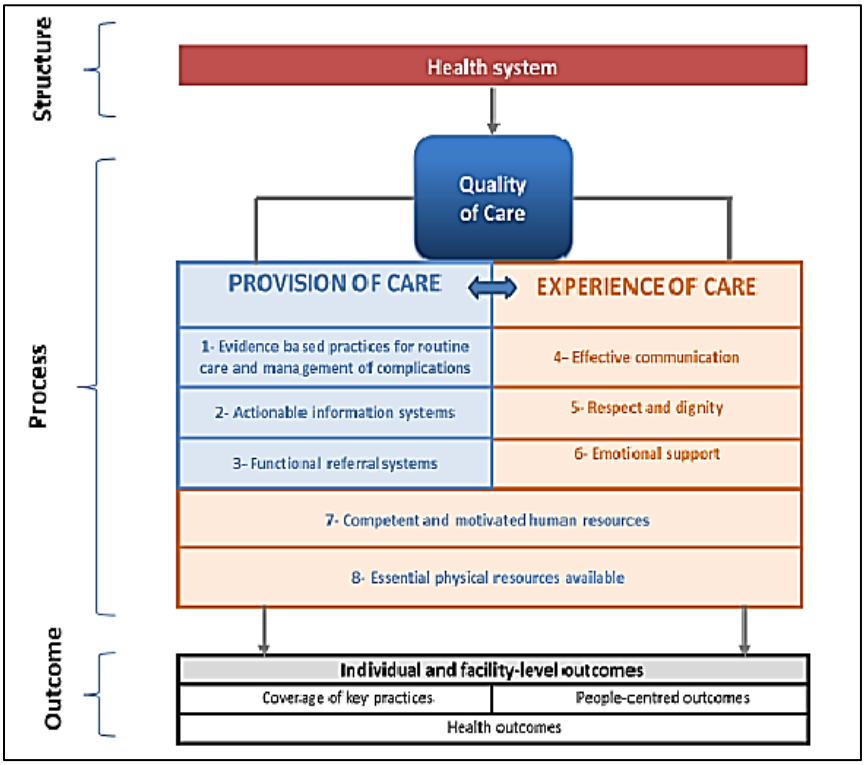
## 1.3 Guiding Principles of Antenatal care service delivery

The World Health Organization (WHO) envisions a world where every pregnant woman and newborn receives quality care throughout the pregnancy, childbirth and the postnatal period. Within the continuum of reproductive health care, antenatal care (ANC) provides a platform for important health-care functions, including health promotion, screening and diagnosis, disease prevention and management of complications during pregnancy. It has been established that by implementing timely and appropriate evidence-based practices, ANC can save lives. Crucially, ANC also provides the opportunity to communicate with and support women, families and communities at a critical time in the course of a woman's life.

The WHO quality of care vision sees a future where "Every mother and newborn receives quality care throughout pregnancy, childbirth and postnatal period".

A WHO framework has been developed to realize this vision with 8 domains of quality of care that encompasses both provision of care and experience of care dimensions which operate within the context of the health system[6].

**Figure 1: WHO Quality of Care Framework for Maternal and Newborn Health of Care Framework for Maternal and Newborn Health**



## 1.4 Governance, Coordination and Organization

Leadership and governance can be considered among key factors that contribute to health improvement. The fourth health sector strategic plan (July 2018 – June 2024) has a strategic direction that states as follows: "By 2024, effective leadership and governance (***oversight, coordination, organization, management, regulation and accountability***) of the health sector is ensured at all levels (public and private)[2].

### 7.1.1. Governance and Coordination of Health services

Within the Ministry of Health, the **Rwanda Biomedical Center (RBC)** has the mission to promote quality affordable and sustainable health care services to the population through innovative and evidence-based interventions and practices guided by ethics and professionalism.

Rwanda's decentralization policy focuses on enhancing the ability of communities to drive their own development under a dynamic local government. It is intended to ensure participation of the community and ownership of their development for more sustainable poverty reduction.

Health personnel and financial resources have been decentralized to the district level, with the MoH bearing responsibility for technical supervision, inter-sectorial coordination (inter-ministerial & other stakeholders discussions), capacity building (MOH to decentralized health facilities) as well as horizontal coordination (between all decentralized health entities). On the other hand, the district governments control the program implementation process. The sector, which is the administrative entity below the district, has become the point of service delivery[7] within the new system, with at least one health center now present in each administrative sector.

Joint Action Forums bring together all local development actors, including community-based organizations, donors, district committees, NGOs and community-based organizations, to discuss development needs, set priorities and define strategies. These forums ensure inclusive and holistic development planning and implementation by bringing together all development stakeholders at district and sector level, in order to ensure coherence and demand–driven rather than supply-driven development initiatives.

The District Health Management Team (DHMT) is a **coordination mechanism** and incorporates membership from existing district-level health managers and local administrative leaders;

### 7.1.2. Organization of ANC services

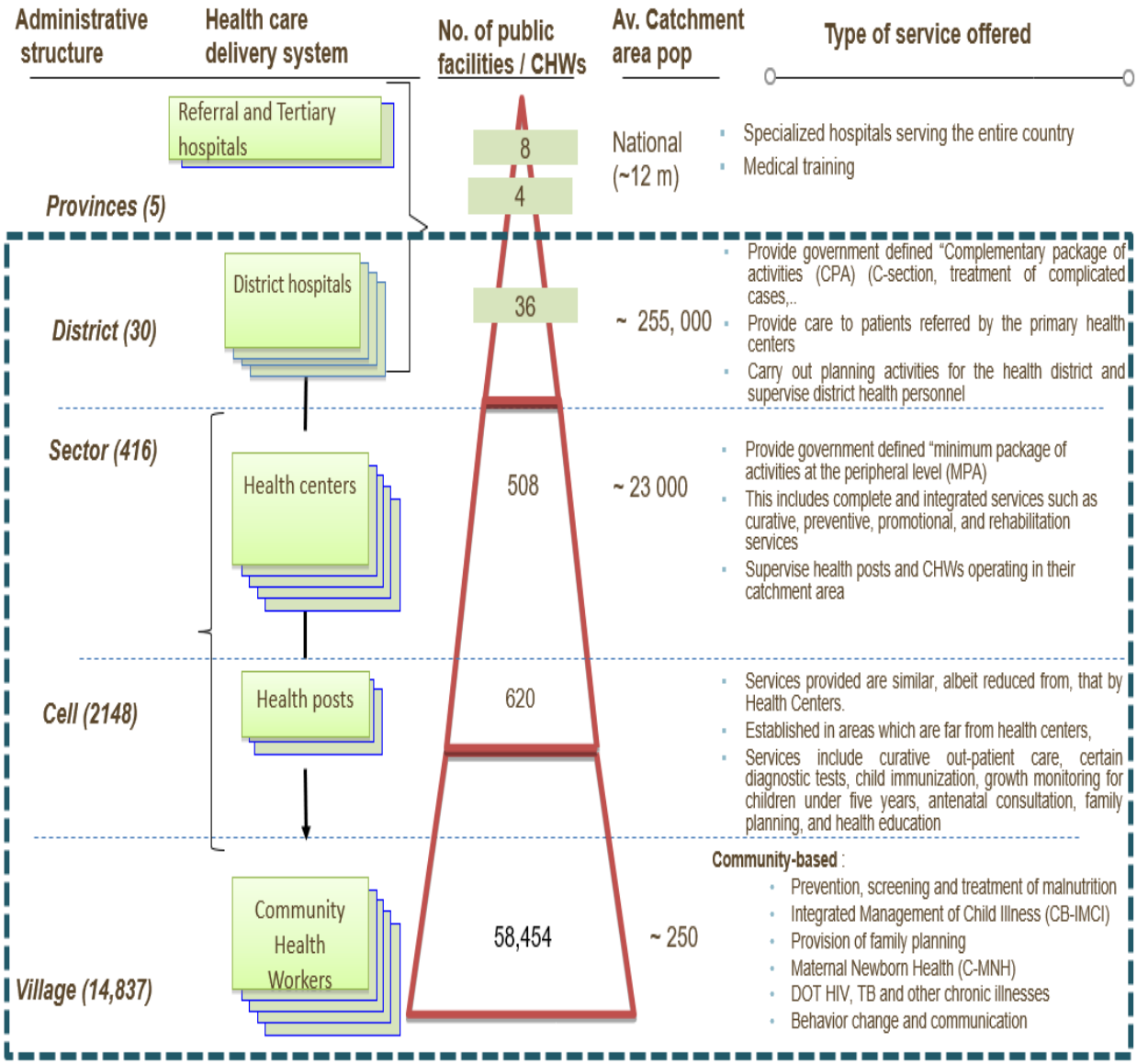
As reflected in the organization chart of RBC, under the Institute of HIV/AIDs, Disease Prevention and Control Department, there is the Maternal, Child and Community Health Division (MCCH).

Trained midwives and nurses are the primary providers of routine ANC care for the woman at the health center/health post level. Progressively, routine antenatal care will be provided at the cell level in a health post. For cases requiring a higher level of care, input from a medical doctor and complex intervention, patients will be referred to district or provincial hospitals for further management.

At the community level, the Community Health Worker in charge of maternal and new-born health (commonly called ASM which is the *("Agent de santé maternelle")* is tasked with identifying and registering women of reproductive age, identifying pregnant women in the community and encouraging them to utilize ANC services.

The national referral and university teaching hospitals (NRH/UTH) are the highest level of care provided in Rwanda.

**Figure 2: Rwanda's Health System (Sources MoH 2019)**




A standardized, national maternity record with an agreed minimum data set will be used. This will help healthcare professionals to provide the recommended evidence-based care to pregnant women as specified for each contact.

# CHAPTER II: ANC CONTACT SCHEDULE

## 2.1. New Schedule of ANC contacts

**Table 1: ANC Schedule for the new model of eight contacts**

| Trimester | Contact | Weeks |
|---|---|---|
| 1st Trimester | 1st Contact | As soon as the woman suspects she is pregnant: up to 12 weeks |
| 2nd Trimester | 2nd Contact | 20 weeks |
| | 3rd Contact | 26 weeks |
| 3rd Trimester | 4th Contact | 30 weeks |
| | 5th Contact | 34 weeks |
| | 6th Contact | 36 weeks |
| | 7th Contact | 38 weeks |
| | 8th Contact | 40weeks |

## 2.2. Essential package of ANC interventions

### Table 2: Essential package of ANC interventions

| Contact | Maternal Assessment | Fetal Assessment | Counseling | Investigations | Radiological tests | Preventive measures | Essential Good clinical Practices | Treat / Manage | Others |
|---|---|---|---|---|---|---|---|---|---|
| **Initial contact regardless of gestation** | Full History, clinical estimation of GA, Complete physical examination, abdominal palpation, TB screening, screening for intimate partner violence (IPV) Screen for patients at high risk for preeclampsia (twin, chronic hypertension, pregestational diabetes) | Refer to the gestational age | Nutrition, diet and physical activity, rest, HIV&STI test, Adherence to medicines prescribed, Avoid: caffeine intake, alcohol, tobacco and substance abuse; Use of LLINs; Danger signs; Emergency preparedness Early stimulation of the baby. Family Planning Importance of attending all contacts | HIV, Syphilis, HBV, urine dipstick, Malaria, Hemoglobin ASB (Gram stain or Culture)- Blood group and Rh; FBC Cervical cancer screening | Ultrasound | Iron and Folic acid, TT/TD, Treat or advise about relief of common physiological symptoms, Combination prevention: PrEp[1], condom, VMMC for men; | Maternal weight/height measurement, MUAC Blood pressure measurement, Male involvement, STI screening. | Common physiological disorders including STIs; complications of early pregnancy | Complete ANC card and give to woman; fill ANC register/CMIS |

[1] PrEp: Pre-Exposure prophylaxis for HIV

| Contact | Maternal Assessment | Fetal Assessment | Counseling | Investigations | Radiological tests | Preventive measures | Essential Good clinical Practices | Treat / Manage | Others |
|---|---|---|---|---|---|---|---|---|---|
| **Contact 1 at 8- 12 weeks** | Full History, clinical estimation of GA, Complete physical exam, abdominal palpation, TB screening, screening for intimate partner violence (IPV) | | Nutrition, diet and physical activity, rest, HIV &STI test, Adherence to medicines prescribed, Avoid: caffeine intake, alcohol, tobacco and substance abuse; Use of LLINs; Danger signs; Emergency preparedness Early stimulation of the baby. Family Planning | HIV, Syphilis, Hep B, urine dipstick, Malaria, Hb estimation Random blood sugar Blood group and Rhesus; Full blood count, check for ASB (Gram stain or Culture), | Ultrasound | Iron and Folic acid, TT/TD, Treat or advise about relief of common physiological symptoms, Combination prevention: PrEp[2], condom, VMMC for men; AB for Asymptomatic bacteriuria | Maternal weight/height measurement, MUAC BP measurement, Male involvement, STI screening. | Common physiological disorders including STIs; complications of early pregnancy | Complete ANC card and give to woman; fill ANC register/CMIS |
| **Contact 2 at 20 weeks** | Ask the mother if she has experienced any problems/changes since last visit, clinical estimation of GA, Physical examination, Symphysis fundal height measurement/abdominal palpation, TB screening, screening for IPV | FHR/Fetal heart sound auscultation after 20weeks; Enquire about quickening | Nutrition, diet and physical activity, rest, HIV &STI test, adherence to medicines prescribed, Avoid: caffeine intake, alcohol, tobacco and substance | urine dipstick, HIV, Syphilis, retest for those who were negative or not tested in the first contact, Hep B, Malaria. | Ultrasound if not yet done | Anthelmintic (single dose Mebendazole 500mg), Fe and folic acid, Calcium, Combination prevention: PrEp, condom, | Maternal weight measurement, MUAC Blood pressure measurement, Male involvement, STI screening. | Common physiological disorders including STIs; complications of early pregnancy | Complete ANC card and give to woman; fill ANC register/CMIS |

[2] PrEp: Pre-Exposure prophylaxis for HIV

| Contact | Maternal Assessment | Fetal Assessment | Counseling | Investigations | Radiological tests | Preventive measures | Essential Good clinical Practices | Treat / Manage | Others |
|---|---|---|---|---|---|---|---|---|---|
| | | | abuse; Use of LLINs; Danger signs; Emergency preparedness; Early stimulation of the baby. Family Planning | | | VMMC[3] for men | | | |
| **Contact 3 - at 26 weeks** | Ask the mother if she has experienced any problems/changes since last visit, clinical estimation of gestational age, Physical examination, Symphysis fundal height measurement/abdominal palpation, TB screening, screening for IPV. Ask about foetal movement, rule out premature rupture of membranes (PROM) | FHR auscultation, ask about foetal movements | Nutrition, diet and physical activity, rest, HIV &STI test, adherence to medicines prescribed, Avoid: caffeine intake, alcohol, tobacco and substance abuse; Use of LLINs; Danger signs; Emergency preparedness Early stimulation of the baby. Family Planning | Urine dipstick, Malaria test; Check Hb; Check ASB | Ultrasound if indicated | IFA, Calcium, combination prevention (PrEp, condom VMMC for men) | Maternal weight measurement, MUAC Blood pressure measurement, Male involvement, STI screening. | Common physiological disorders including STIs; complications of early pregnancy | Complete ANC card and give to woman; fill ANC register/CMIS |

[3] VMMC: voluntary medical male circumcision

| Contact | Maternal Assessment | Fetal Assessment | Counseling | Investigations | Radiological tests | Preventive measures | Essential Good clinical Practices | Treat / Manage | Others |
|---|---|---|---|---|---|---|---|---|---|
| **Contact 4 at 30 weeks** | Ask how the mother is doing, clinical estimation of gestational age, Physical examination, Symphysis fundal height measurement/abdominal palpation, TB screening, screening for IPV. Ask about fetal movement, rule out premature rupture of membranes (PROM) | FHR auscultation, ask about fetal movements | Nutrition, diet and physical activity, rest, HIV &STI test, adherence to medicines prescribed, Avoid: caffeine intake, alcohol, tobacco and substance abuse; Use of LLINs; Danger signs; Emergency preparedness Early stimulation of the baby. Family Planning | Urine dipstick, HIV and syphilis re-test for those who were negative, Malaria test, Blood sugar | Ultrasound if indicated | IFA, Calcium, combination prevention (PrEp, condom VMMC for men) | Maternal weight measurement, MUAC Blood pressure measurement, Male involvement, STI screening. | Common physiological disorders; manage complications of pregnancy | Complete ANC card and give to woman; fill ANC register/CMIS |
| **Contact 5 at 34 weeks** | Ask how the mother is doing, clinical estimation of gestational age, Physical examination, Symphysis fundal height measurement/abdominal palpation, TB screening, screening for IPV. Ask about fetal movement, rule out premature rupture of membranes (PROM) | FHR auscultation, ask about fetal movements | Nutrition, diet and physical activity, rest, HIV &STI test, adherence to medicines prescribed, Avoid: caffeine intake, alcohol, tobacco and substance abuse; Use of LLINs; | Urine dipstick, Malaria test Check Asymptomatic bacteriuria | Ultrasound if indicated | IFA, Calcium, combination prevention (PrEp, condom VMMC for men) | Maternal weight measurement, MUAC Blood pressure measurement, Male involvement, STI screening. | Common physiological disorders; manage complications of pregnancy | Complete ANC card and give to woman; fill ANC register/CMIS |

| Contact | Maternal Assessment | Fetal Assessment | Counseling | Investigations | Radiological tests | Preventive measures | Essential Good clinical Practices | Treat / Manage | Others |
|---|---|---|---|---|---|---|---|---|---|
| | | | Danger signs; Emergency preparedness; Early stimulation of the baby. Family Planning | | | | | | |
| **Contact 6 at 36 weeks** | Ask how the mother is doing, clinical estimation of gestational age, Physical examination, Symphysis fundal height measurement/abdominal palpation, TB screening, screening for IPV. Ask about fetal movement, rule out premature rupture of membranes (PROM) | FHR auscultation; ask about fetal movements | Nutrition, diet and physical activity, rest, HIV &STI test, adherence to medicines prescribed, Avoid: caffeine intake, alcohol, tobacco and substance abuse; Use of LLINs; Danger signs; Emergency preparedness; Early stimulation of the baby. Family Planning | Urine dipstick, Malaria test Check HB | Ultrasound if indicated | IFA, Calcium, combination prevention (PrEp, condom VMMC for men) | Maternal weight measurement, MUAC Blood pressure measurement, Male involvement, STI screening. | Common physiological disorders; manage complications of pregnancy | Complete ANC card and give to woman; fill ANC register/CMIS |
| **Contact 7 at 38 weeks** | Ask how the mother is doing, clinical estimation of gestational age, Physical examination, Symphysis fundal height measurement/abdominal | FHR auscultation, ask about fetal movements | Nutrition, diet and physical activity, rest, HIV test, Avoid: caffeine intake, alcohol, tobacco and | Urine dipstick, HIV and Syphilis re-test for those who were negative, Malaria test, | Ultrasound if indicated | IFA, Calcium, combination prevention (PrEp, condom VMMC for men) | Maternal weight measurement, MUAC Blood pressure measurement, | Common physiological disorders; manage complications of pregnancy | Complete ANC card and give to woman; fill ANC register/CMIS |

| Contact | Maternal Assessment | Fetal Assessment | Counseling | Investigations | Radiological tests | Preventive measures | Essential Good clinical Practices | Treat / Manage | Others |
|---|---|---|---|---|---|---|---|---|---|
| | palpation, TB screening, screening for IPV. Ask about fetal movement, rule out premature rupture of membranes (PROM) | | substance abuse, IPV: Use of LLINs; Danger signs, Emergency preparedness, Infant and young child feeding, Breastfeeding, Breast care, FP/HTSP, Birth planning; EIMC, Early stimulation of the baby. | | | | Male involvement, STI screening. | | |
| **Contact 8 at 40 weeks** | Ask how the mother is doing last, clinical estimation of gestational age, Physical examination, Symphysis fundal height measurement/abdominal palpation, TB screening, screening for IPV. Ask about fetal movement, rule out premature rupture of membranes (PROM), Ask about symptoms of labour | FHR auscultation, ask about fetal movements | Nutrition, diet and physical activity, rest, HIV test, Avoid: caffeine intake, alcohol, tobacco and substance abuse, IPV: Use of LLINs; Danger signs, Emergency preparedness, IYCF, Breastfeeding, Breast care, | Urine dipstick, Malaria test | Ultrasound if indicated | IFA, Calcium, combination prevention (PrEp, condom VMMC for men) | Maternal weight measurement, MUAC Blood pressure measurement, Male involvement, STI screening. | Common physiological disorders; manage complications of pregnancy | Complete ANC card and give to woman; fill ANC register/CMIS |

| Contact | Maternal Assessment | Fetal Assessment | Counseling | Investigations | Radiological tests | Preventive measures | Essential Good clinical Practices | Treat / Manage | Others |
|---|---|---|---|---|---|---|---|---|---|
| | | | FP/HTSP, Birth planning; EIMC, Early stimulation of the baby; Counsel on admission if no signs of labour at 41 weeks. | | | | | | |
| **Cadres to provide the services** | **Midwives, Obstetricians, Doctors** | **Midwives, Obstetricians, Doctors** | **Midwife, nurses, dieticians, nutritionists, health promotion, community health workers, Doctors, Obstetricians.** | **Midwives, nurses, Doctors Lab technician** | **Radiology, Obstetricians, midwives, sonographers (if any).** | **Nurses and midwifes** | **Midwives, (BP) Obstetricians (BP), Doctors (BP); Community health workers (Weight, MUAC, Height)** | **Midwives, Doctors, Obstetricians** | **Midwives, Obstetricians, Doctors** |

**NB:**

1. **All cadres will be expected to provide IEC, depending on the roster- all midwives will be expected to provide individual counseling**
2. **Health promotion will be done for community engagement**
3. **Complete ANC card, enter information into the register and give the card to the pregnant woman**
4. **ANC services are offered at health posts and health centers, district, provincial and referral hospitals**
5. **Referral for complications to the next level**

# CHAPTER III: PROVIDING ANC SERVICES

## 3.1. History taking

The service provider should undertake a comprehensive history including:

- **Identification**: Names, age, home address, contact address, phone, next of kin and his/her address and phone;
- **Obstetric and Gynecological history**: number of previous pregnancies and outcome of each; previous cesarean sections, problems and complications including bleeding;
- **Medical history**: hypertension, asthma, convulsions, heart diseases, diabetes, tuberculosis, and other past and current medical problems; current medications including use of medications and herbal/traditional remedies, drug history including allergies
- **Family history**: (e.g., genetic disorders)
- **Pregnancy and delivery history**: gestate, term pregnancy, premature deliveries Recurrent abortions, still births/death immediately after birth, Postpartum hemorrhage in the past, Previous retained placenta, c/sections ruptured uterus Pre/Eclampsia, Multipara pregnancy (> 6 pregnancies);

## 3.2. Maternal and Fetal assessment

Maternal screening forms part of the routine assessment of the pregnant woman where the provider must do the following:

- Ask about the mother's concerns;
- Clinical estimation of gestational age;
- Examination head to toe;
- Abdominal palpation;
- Pelvic examination if necessary;
- Screen for Preeclampsia, Anemia and Asymptomatic Bacteriuria, TB, Malaria, HIV, Syphilis, Hepatitis, gestational diabetes, substance abuse and IPV as appropriate for contact;
- Measure gestational age through a Symphysis fundal height (SFH) which is measured using a tape measure. The measurement should correspond to the gestational age of the pregnancy with an allowance of 2cm either ways. Abdominal palpation can also be used to measure fund height. In Rwanda, SFH is the most used.
- Undertake an ultrasound examination at appropriate gestation as per the guidelines;

- Nutritional Assessment: Height measurement should be performed at the first contact and BMI should be calculated as a baseline assessment for all pregnant women; Weight measurement and calculation of weight gain starting from the second contact (current weight minus weight first contact), MUAC should be assessed at each contact. Symptoms of diabetes to be assessed; if presence of symptoms, plasma glucose to be measured (fasting, one hour, two hours).
- Blood pressure monitoring at each contact;
- Test mid-stream urine for protein;
- Enquire about fetal movement from 20 weeks;
- An Ultrasound scan is to be done for every pregnant woman before 24 weeks to identify the following: gestational age, foetal viability, anomalies (multiple pregnancies, etc.). In case of complications such as antepartum hemorrhage mal-presentations, IUGR, an additional ultrasound may be performed.

### 3.3. Foetal assessment

Foetal heart rate (FHR) must be monitored in all pregnant women. A normal FHR is 110 – 160 beats/minute; while an Abnormal FHR <110 b/m and >160 b/m; enquire about fetal movement from 20 weeks.

### 3.4. Laboratory

- **Hemoglobin**: Hemoglobin testing as a routine practice will be performed to detect anemia in pregnancy. At health center and health post, hemoglobin testing will be done using a hemoglobinometer (*HemoCue*®).
- **Urine dipstick:** urine culture testing is the most accurate means of detecting asymptomatic bacteriuria. However, in health centers and health posts, dipstick tests will be used; if positive, refer for confirmation in hospitals. Urine dipsticks test is used for nitrites which are not found in normal urine and for leucocytes which are identified by a reaction with leucocyte esterase to identify the presence of bacteria and pus in the urine. Dipsticks will be also used for testing sugar and protein in urine.
- Counselling and testing for HIV and Syphilis;
- Test for Malaria and TB;
- Screening for Hepatitis B.

- At hospital level, the full blood count will be used as the method for diagnosing anemia in pregnancy.
- Midstream urine culture will be used for diagnosis of asymptomatic bacteriuria
- Blood group and Rhesus test.

## 3.5. Preventive measures

Health care providers must ensure that all pregnant women get all recommended preventive measures in line with the 8-contact schedule including treatment of asymptomatic bacteria, prevention of Tetanus, Nutritional anaemia, HIV, Intestinal worms and malaria in pregnancy (refer to the essential package for ANC interventions)

### 3.5.1. Treatment for asymptomatic bacteriuria (ASB)

Defined as true bacteriuria in the absence of specific symptoms of acute urinary tract infection, ASB is common in pregnancy. Asymptomatic bacteriuria simply refers to the detection of a high number of bacteria in a urine sample and urine culture is the gold standard for accurate diagnosis. As mentioned above, given limited resources in Rwanda context, dipstick tests will be used, and this is to be done at the first prenatal contact. In pregnant women, obstruction to the flow of urine by the growing fetus and womb leads to stasis in the urinary tract and increases the likelihood of acute pyelonephritis. If untreated, up to 45% of pregnant women with ASB may develop this complication (126), which is associated with an increased risk of preterm birth. A seven-day antibiotic regimen is recommended for all pregnant women with **asymptomatic ASB** to prevent persistent bacteriuria, preterm birth and low birth weight[8]. Ideally, the choice of antibiotics should be based on culture and sensitivity results[9].

***First choice***

• Nitrofurantoin 100 mg (per os and four times daily) for 7 days

***Alternative***

• Amoxicillin tab 500mg (Three times daily) for 7 days

### 3.5.2. Tetanus toxoid vaccination

Tetanus is an acute disease caused by an exotoxin produced by Clostridium tetani. Neonatal infection usually occurs through the exposure of the unhealed umbilical cord stump to tetanus spores, which are

universally present in soil, and newborns need to have received maternal antibodies via the placenta to be protected at birth.

Neonatal disease usually presents within the first two weeks of life and involves generalized rigidity and painful muscle spasms, which in the absence of medical treatment leads to death in most cases[10]. Global vaccination programs have reduced the global burden of neonatal tetanus deaths and continue to do so.

In Rwanda, 34% of women who had a live birth received two or more doses of anti-tetanus vaccine during their most recent pregnancy. This figure has not changed since 2010. Considering mothers who had previous protection against tetanus, the proportion protected against tetanus rises to 82 percent, an increase from 79 percent in 2010. This means that 18 percent of pregnant women were not protected against tetanus[3]. Because tetanus spores are ubiquitous in the environment, eradication is not biologically feasible and high immunization coverage remains essential[11].

If there is no evidence of previous tetanus diphtheria (Td) immunization, two doses at least one month apart in each pregnancy should be administered. A newborn is protected against neonatal tetanus if the mother has received any of the following:

- ✓ Two Td injections during the present pregnancy;
- ✓ Two or more injections, the last one within three years of the current pregnancy;
- ✓ Three or more injections, the last one within five years of the current pregnancy;
- ✓ Four or more injections, the last one within 10 years of the current pregnancy;
- ✓ Five or more injections at any time prior to the current pregnancy;

When the mother has active immunity, the antibodies pass through the placenta, protecting the newborn. A woman is protected when she has received two vaccine doses at least four weeks apart, with an interval of at least four weeks between the last vaccine dose and pregnancy termination.

Women who last received a vaccination series (five injections) more than 10 years before the present should be given a booster. In most women, a booster is recommended in every pregnancy.

**Figure 3: Schedule for Tetanus Toxoid administration.**

| Dose | Time for administration | Duration of protection |
|---|---|---|
| **TT1** | At first contact | **No protection** |
| **TT2** | 4 weeks after TT1 | **Three years** |

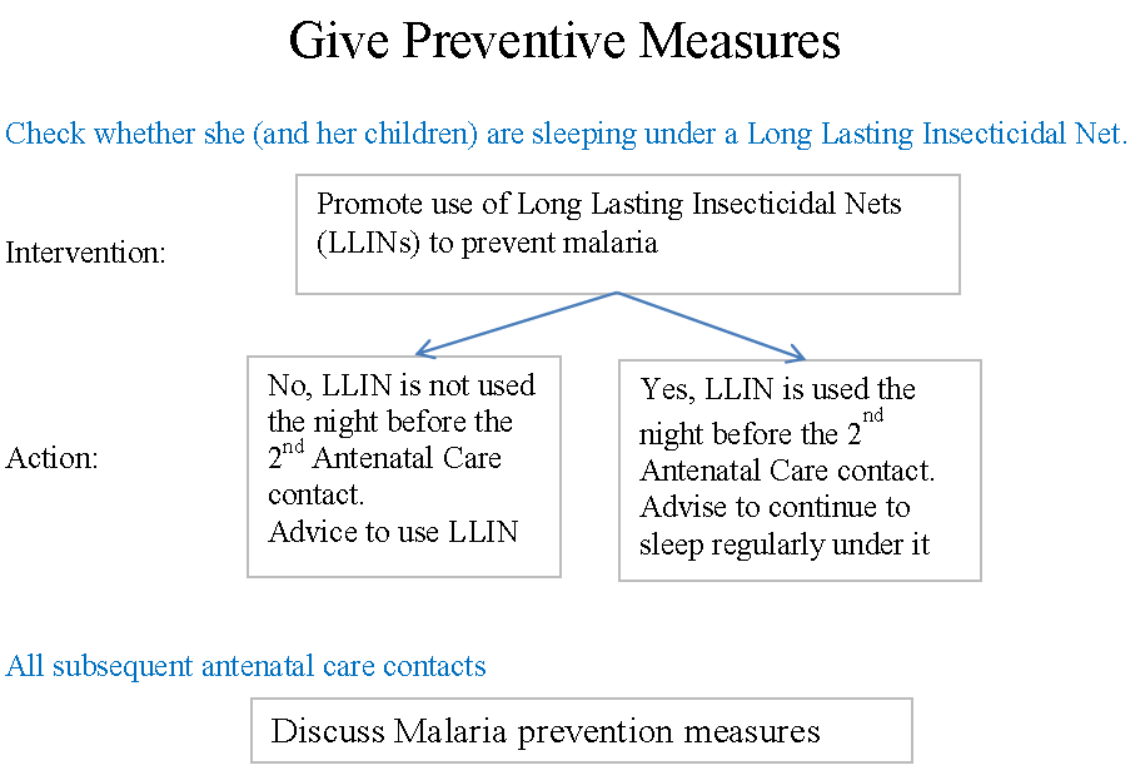
| | | |
|---|---|---|
| **TT3** | At least 6 months after TT2 | **Five years** |
| **TT4** | At least one-year TT3 | **Ten years** |
| **TT5** | **At least one year after TT4** | **For thirty years** |

### 3.5.3. Malaria in Pregnancy prevention

Provision of LLIN and counseling on other malaria prevention measures (refer to malaria treatment guideline)[14].

Intermittent preventive treatment (IPT) was considered not helpful in Rwanda due a high resistance to Sulfadoxine-Pyrimetamine (SP); rather the focus is on case identification and management in addition to prevention using LLINs and other general prevention measures. A study is underway to establish the best prophylaxis in the Rwandan context.

**Figure 4: Algorithm for malaria preventions measures**




### 3.5.4. Gestational diabetes mellitus (GDM)

- GDM is a common medical complication of pregnancy with significant risk to the fetus and the mother. Women with GDM detected during pregnancy are at greater risk of adverse pregnancy

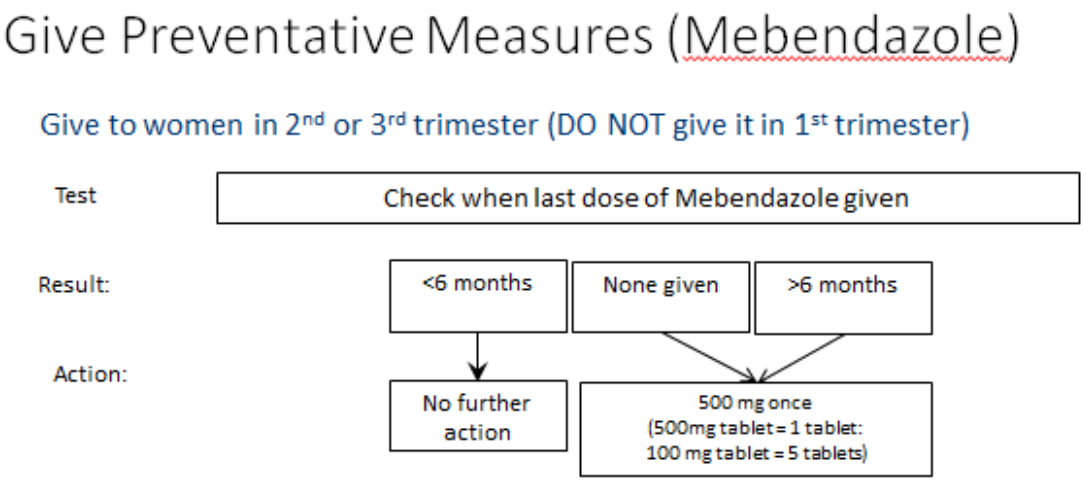
outcomes, including macrosomia, pre-eclampsia/hypertensive disorders in pregnancy, and shoulder dystocia.

- Women with risk factors such as BMI of greater than 30 kg/m2, previous GDM, previous macrosomia, family history of diabetes mellitus or those with clinical signs should always be screened for GDM.
- Glycosuria in pregnancy may be the first sign of gestational diabetes. Test GDM using Dipstick tests. If positive, refer to hospital for further investigations.
- The usual window for diagnosing GDM is between 24 and 28 weeks of gestation.
- Glycosuria of 2+ or above may indicate a need for confirmation by random blood sugar. Fasting plasma glucose > 7mmol/l or random plasma glucose > 11.1 mmol/l or Hyperglycemia first detected at any time during pregnancy should be classified as either:
  - Diabetes mellitus in pregnancy
  - Gestational Diabetes mellitus
- If GDM is detected, treatment should be initiated with nutritional counseling and exercise followed by oral blood-glucose-lowering agents or insulin if necessary. This treatment is effective in reducing the risk of poor outcomes.

### 3.5.5. Deworming

✓ Give mebendazole (500 mg) once during second or third trimester of pregnancy to every woman.

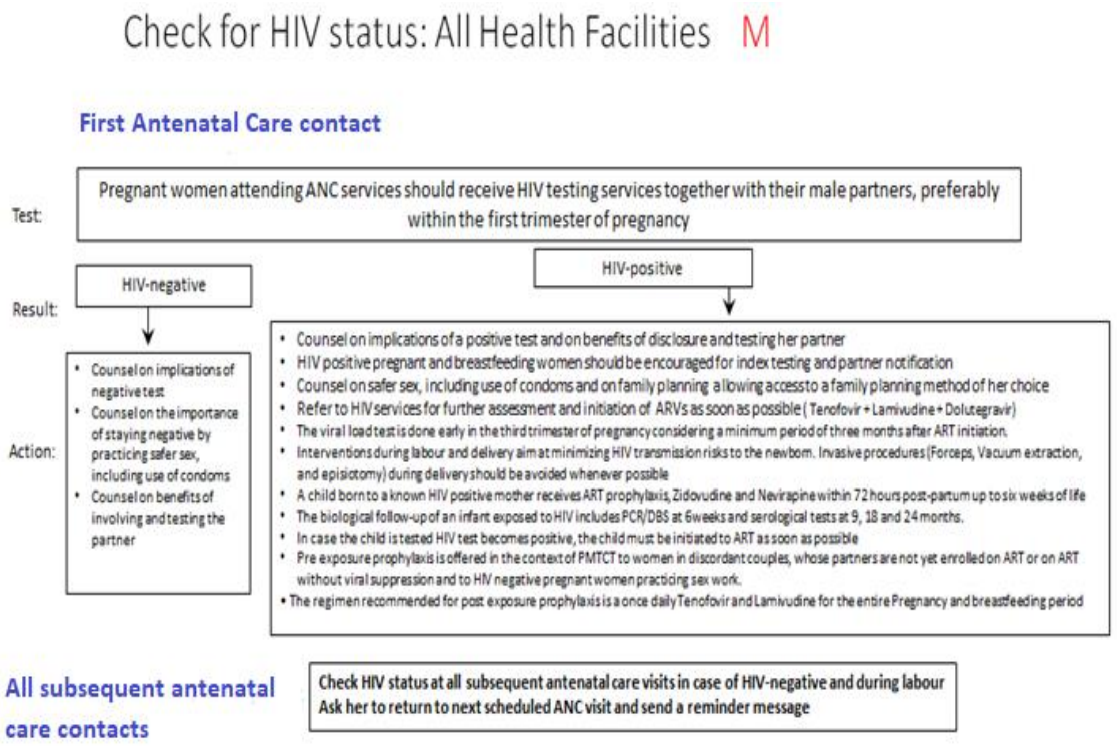
**Figure 5: Algorithm for Deworming**



### 3.5.6. HIV

- ✓ Prevention of HIV transmission from mother to Child (refer to PMTCT guideline);
- ✓ Ensure all women receive HIV counseling and testing and if positive women receive ARVs.
- ✓ Combination prevention: PrEp, condom and voluntary medical male circumcision (VMMC) for men.

**Figure 6: Algorithm for HIV checking status**




## 3.6. Management of common physiological symptoms

Women's bodies undergo substantial changes during pregnancy, which are brought about by both hormonal and mechanical effects. These changes lead to a variety of common symptoms – including nausea and vomiting, low back and pelvic pain, heartburn, varicose veins, constipation and leg cramps – that in some women cause severe discomfort and negatively affects their pregnancy experience. In general, symptoms associated with mechanical effects, e.g. pelvic pain, heartburn and varicose veins, often worsen as pregnancy progresses.

### 3.6.1. Nausea and vomiting

Pregnant women should be informed that symptoms of nausea and vomiting usually resolve in the second half of pregnancy. Ginger, chamomile, and vitamin B6 are recommended for the relief of nausea in early pregnancy, based on woman's preferences and available options.

Pregnant women with persistent vomiting or with severe symptoms and signs of dehydration, reduced urine output, and dark-colored urine should be referred to hospital level.

### 3.6.2. Heartburn

Lifestyle advice to prevent and relieve symptoms of heartburn includes avoidance of large, fatty meals and alcohol, cessation of smoking, and raising the head of the bed to sleep. Antacids, such as magnesium carbonate and aluminum hydroxide preparations can also be prescribed if symptoms are not relived with lifestyle modification.

### 3.6.3. Leg cramps

Non-pharmacological treatment options like muscle stretching, dorsiflexion, relaxation, heat therapy, massage can be used for the relief of leg cramps in pregnancy, based on a woman's preferences and available options.

In addition to multivitamin, Magnesium and calcium supplementation can also be prescribed according to the woman preferences and options.

### 3.6.4. Low back and pelvic pain

Regular exercise throughout pregnancy is recommended to prevent low back and pelvic pain. There are a several number of different treatment options, such as physiotherapy and support belts based on a woman's preferences and availability. Refer to hospital level if exercise does not improve symptoms.

### 3.6.5. Constipation

Dietary modifications should include increasing intake of fruits, vegetables, high fiber foods and water; if these fails, fiber supplements can be used to relieve constipation in pregnancy based on a woman's preferences and available options.

### 3.6.6. Varicose veins and edema

Non-pharmacological options, such as compression stockings and leg elevation can be used for the management of varicose veins and edema in pregnancy, based on a woman's preferences and available options. Refer to hospital level if symptoms are severe.

# CHAPTER IV: COUNSELING AND INFORMATION PROVISION

## 4.1. Caffeine intake

WHO recommends limiting intake to less than 300 mg of caffeine during pregnancy (not more than 2 cups of coffee or six cups of tea a day) to reduce the risk of pregnancy loss and low birth weight. Other caffeinated beverages (e.g., colas, energy drinks, green tea) should also be limited.

## 4.2. Smoking, alcohol and substance abuse

In Rwanda Tobacco use among women vary per district; in some districts, it can be as high as 10% and this includes smoking or other form of tobacco use like chewing.

Asking women at every ANC contact is important as some women are more likely to report sensitive information only after a trusting relationship has been established.

Health-care providers should routinely offer advice and psychosocial interventions for no tobacco smoking, Tobacco cessation to all pregnant women who are either current tobacco users or recent tobacco quitters.

Health-care providers should provide pregnant women, their partners and other household members with advice and information about the risks of second-hand smoke (SHS) exposure from all forms of smoked tobacco, as well as strategies to reduce SHS in the home.

Health-care providers should, wherever possible, engage directly with partners and other household members to inform them of all the risks of SHS exposure to pregnant women from all forms of tobacco, and to promote reduction of exposure and offer smoking cessation support.

All health-care facilities should be smoke-free to protect the health of all staff, patients and visitors, including pregnant women.

Although prevalence of substance use among pregnant women in Rwanda is unknown, there are anecdotal stories of women using substance like plants which caused fetal distress.

Substance use includes alcohol and other substances that can put the life of the mother and fetus at risk. Pregnant women should be advised of the potential health risks to themselves and to their babies posed by alcohol, drug use and any other substance use. Unspecified plant medicinal products without qualification with a recognized institution should be discouraged.

### 4.3. Counsel on Family planning

Discuss with the pregnant woman on methods of Family planning (ideally involve the male partner);

Counsel the pregnant woman on the importance of family planning and the contraceptive options available for the postpartum period.

Encourage the woman to choice post-partum family planning method.

### 1.4 Early stimulation of the baby

ANC provides an important opportunity for discussion between a pregnant woman and a health care provider about the importance of early childhood development. The period from pregnancy to age 3 is the most critical period of life because the brain grows faster than at any other age; 8% of a baby's brain is formed by this age. For healthy brain development in these years, children need a safe, secure and loving environment, with the right nutrition and stimulation from their parents or caregivers. Advice to the pregnant woman on baby stimulation whilst in utero is crucial. The following are suggestions:

- Contact your baby in some way every day in a private, peaceful and quiet place (be consistent);
- Get comfortable and relax - "focus only on your baby for at least 15 minutes twice a day or 30 minutes in one go;
- You can play music, simply talk to your baby or read the baby a story while you massage your belly and make this a habit and continue to do this throughout pregnancy, especially after the sixth month.
- Encourage the woman to allow the father to experiment with different ways of massaging the mother's belly as his touch will make her feel loved and special and these feelings will pass on to the baby who will feel the same.

During this period, we lay down critical elements of our health, well-being and productivity, which will last throughout childhood, adolescence and adulthood. By the end of the second trimester of pregnancy, the growing fetus can hear.

Nurturing care is necessary for all babies, but premature and low-birth weight babies (and babies with congenital conditions) need it even more.

An adverse environment harms development – both in the short term and, importantly, the longer term[16].

## 1.5 Danger signs

Abnormal or danger signs during pregnancy should be reminded by health professional and promptly seen verified during antenatal care consultations:

Teach the pregnant woman and her family to report any of the following conditions immediately:

- Vaginal bleeding
- Sudden gush of fluid or leaking of fluid from vagina
- Severe headache not relieved by simple analgesics (e.g. Paracetamol)
- Dizziness and blurring of vision
- Sustained vomiting
- Swelling (hands, face, etc.)
- Decrease or Loss of fetal movements
- Convulsions
- Premature onset of contractions (before 37 weeks)
- Severe or unusual abdominal pain, chills or fever

## 4.4. Routine and follow-up contacts

- Stress the importance of ANC follow up contacts
- Provide to pregnant woman the basic ANC schedule of follow up contacts for women without any risk factor.

## 4.5. Intimate Partner Violence

Intimate Partner violence can lead to adverse reproductive outcomes, including multiple unintended pregnancies and/or terminations, delay in seeking ANC, adverse birth outcomes, and repeated STIs.

IPV may be suspected in following situations:

- ✓ unexplained or repeated genitourinary symptoms;
- ✓ symptoms of depression and anxiety;
- ✓ alcohol and other substance use;
- ✓ Self-harm, suicidality, symptoms of depression and anxiety.

IPV can involve situations such as being beaten up, choked or burnt on purpose, being threatened with or having a weapon used against her, and sexual violence.

According to DHS 2015, 44 % of women aged 15 to 49 years reported that they have ever experienced either physical or sexual violence. When it comes to pregnant women 8% of women have ever experienced physical violence during pregnancy.

Clinical enquiry about the possibility of intimate partner violence (IPV) should be strongly considered at antenatal care contacts when assessing conditions that may be caused or complicated by IPV in order to improve clinical diagnosis and subsequent care. Persistent low mood, unexplained bruises and other injuries may be indications of abuse.

### 4.5.1. Psychosocial support of women victim of Intimate Partner Violence

Violence against women by their intimate partners affects women's physical and mental health, including their reproductive health. While you may not have been trained to deal with this problem, women may disclose violence to you, or you may see unexplained bruises and other injuries which make you suspect she may be suffering abuse. The following are some recommendations on how to respond and support her:

- Provide a space where the woman can speak to you in privacy where her partner or others cannot her. Do all you can to guarantee confidentiality and reassure her of this
- Gently encourage her to tell you what is happening to her. You may ask indirect questions to help her tell her history
- Listen to her in a sympathetic manner. Listening can often be of great support. Do not blame or make a joke of the situation. She may defend her partner's action. Reassure her that she does not deserve to be abused in any way.
- Help her to assess her present situation. If she thinks she or her children are in danger, explore together the options to ensure her immediate safety (e.g. can she stay with her parents or friends? Does she have, or could she borrow, money?)
- Explore her options with her. Help her identify local sources of support, either within her family, friends, and local community or through NGOs, shelters or social services, if available. Remind her that she has legal recourse, if relevant.

- Offer her an opportunity to see you again. Violence by partners is complex, and she may be unable to resolve her situation quickly.
- Document any forms of abuse identified or concerns you may have in the file

### 4.5.2. Emotional support for the pregnant women with special needs

When giving emotional support to the woman with special needs it is particularly important to remember the following:

#### *4.5.2.1. Create a comfortable environment*

- Be aware of your attitude
- Be open and approachable
- Use a gentle, reassuring tone of voice.

#### *4.5.2.2. Guarantee confidentiality and privacy*

- Communicate clearly about confidentiality. Tell the woman that you will not tell anyone else about the visit, discussion or plan.
- If brought by a partner, parent or other family member, make sure you have time and space to talk privately. Ask the woman if she would like to include her family members in the examination and discussion. Make sure you seek her consent first.
- Make sure the physical area allows privacy.

#### *4.5.2.3. Convey respect:*

- Do not be judgmental
- Be understanding of her situation
- Overcome your own discomfort with her situation.

#### *4.5.2.4. Give simple, direct answers in clear language*

- Verify that she understands the most important points.

#### *4.5.2.5. Be a good listener with the following attitudes*

- Be patient. Women with special needs may need time to tell you their problem or make a decision.
- Pay attention to her as she speaks.

#### *4.5.2.6. Follow-up visits may be necessary. When possible, explore needs and alternatives for support through the following*

- Community groups, women's groups, leaders.
- Peer support groups.
- Other health service providers such as mental health professionals.

### 4.5.3. Special considerations in management of the pregnant adolescent

Special training is required to work with adolescent girls and this guide does not substitute for special training. However, when working with pregnant adolescent, whether married or unmarried, it is particularly important to remember the following:

- Do not be judgmental. You should be aware of, and overcome, you own discomfort with adolescent sexuality
- Encourage the girl to ask questions and tell her that all topics can be discussed.
- Use simple and clear language.
- Repeat guarantee of confidentiality.
- Understand adolescent difficulties in communicating about topics related to sexuality (fears of parental discovery, adult disapproval, social stigma, etc).
- Does she live with her parents; can she confide in them? Does she live as a couple? Is she in a long term relationship? Has she been subject to violence or coercion?
- Determine who knows about this pregnancy — she may not have revealed it openly.
- Support her concerns related to puberty, social acceptance, peer pressure, forming relationships, social stigmas and violence.

# CHAPTER V: MANAGEMENT OF MENTAL PROBLEMS IN PREGNANCY

Pregnancy and the period from childbirth to the end of the first postnatal year comprise one of the most important times of a woman's life, but for women with a mental health problem it can be difficult and distressing. In pregnancy and the postnatal period, women are vulnerable to having or developing the same range of mental health problems as other women, and the nature and course of the large majority of these problems are similar in women at other times of their lives. However, the nature and treatment of mental health problems in pregnancy and the postnatal period differ in a number of important respects.

## 5.1. Management of mental health problems in pregnancy

Recognize that women who have a mental health problem (or are worried that they might have) may be:

- Unwilling to disclose or discuss their problem because of fear of stigma, negative perceptions of them as a mother or fear that their baby might be taken into care
- Reluctant to engage, or have difficulty in engaging, in treatment because of avoidance associated with their mental health problem or dependence on alcohol or drugs.

During the assessment mental health problem interview should include the following:

- history of any mental health problem, including in pregnancy or the postnatal period
- physical wellbeing (including weight, smoking, nutrition and activity level) and history of any physical health problem
- alcohol and drug misuse
- the woman's attitude towards the pregnancy, including denial of pregnancy
- the woman's experience of pregnancy and any problems experienced by her, the fetus or the baby
- the mother–baby relationship
- any past or present treatment for a mental health problem, and response to any treatment
- social networks and quality of interpersonal relationships
- living conditions and social isolation
- family history (first-degree relative) of mental health problems
- domestic violence and abuse, sexual abuse, trauma or childhood maltreatment
- housing, employment, economic and immigration status
- responsibilities as a care for other children and young people or other adults.

## 5.2. Assessment and management of suicide risk

Suicide is the common cause of death during pregnancy and in the first postpartum year. It is important that women who are depressed and have suicidal though in the perinatal period be assessed for suicide risk and if present, appropriate action taken.

### 5.2.1. Perinatal suicide risk assessment

Begin the discussion with: "***Sometimes when women are depressed, they have thoughts about harming themselves***". Then proceed to the following questions:

1. Have you had any thoughts of harming yourself?

If yes:

- Can you describe your thoughts of harming yourself?
- How frequent and persistent are these thoughts
- Do you have a definite plan to harm yourself?
- Do you have a definite plan to end your life?
- Do you have the means to carry out your plan?
- How close have you from acting on this plan?
- What stopped you from acting on this plan?

If NO:

- Do you ever wish that you were dead?
- Do you ever wish that you could escape or disappear or not wake up in the morning?

2. Have you attempted to harm yourself in the past?

If Yes:

- Can you tell me about?
- Did you want to die at that time?
- Were you drink alcohol or using drugs
- Were you admitted to hospital?
- How did you feel after the attempt?

3. Is there a family history of suicide?

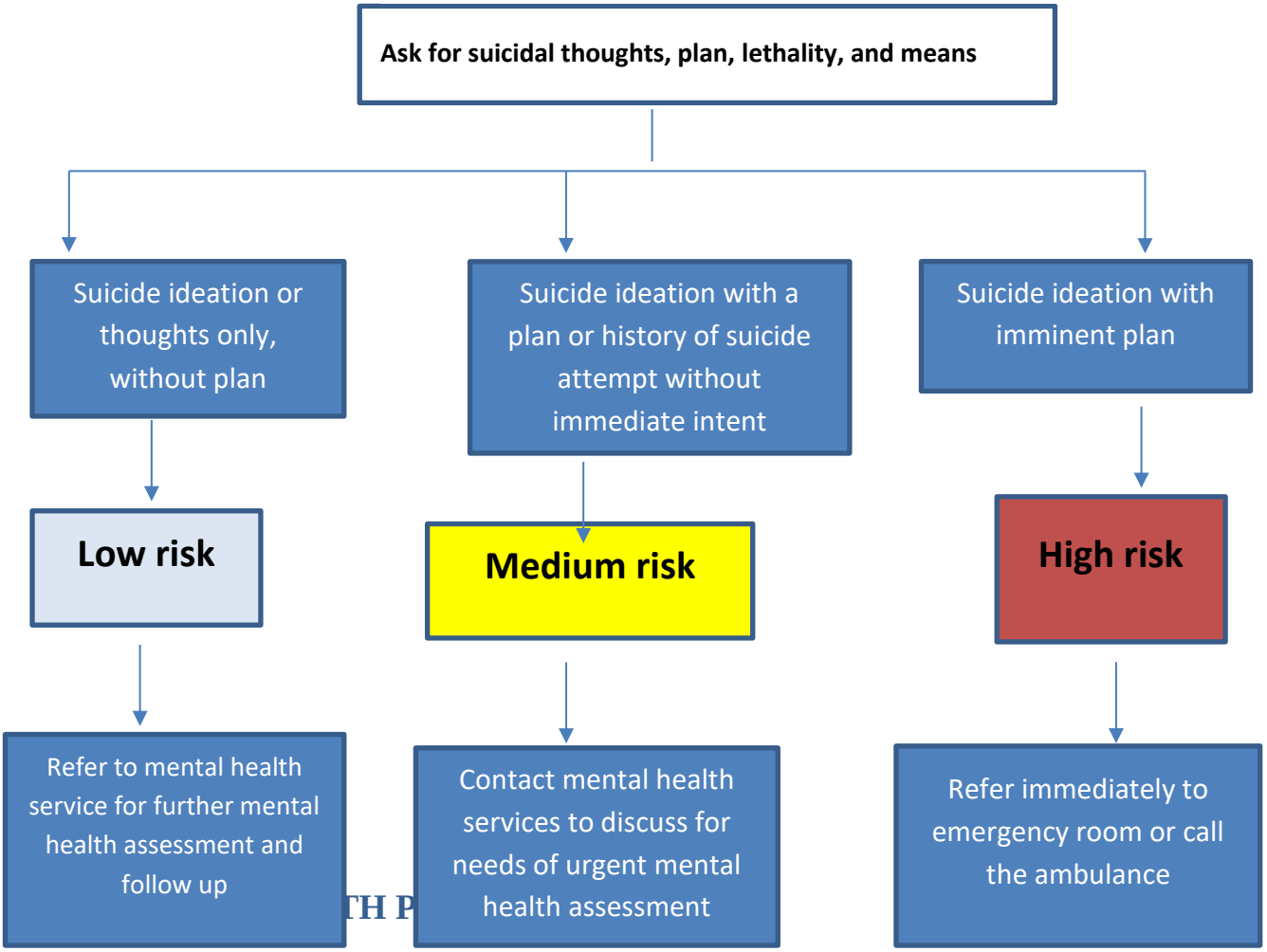
If yes:

- Can you tell me about it?

**If you are concerned that the patient is a suicide risk, develop a safety plan and refer immediately to mental health service for psychiatric care.**

### 5.2.2. Management of perinatal suicide risk

**Figure 7: Algorithm for management of suicide**




Birth Preparedness and Complication Readiness is the process of planning for normal birth and anticipating the actions needed in case of an emergency. So, every woman and her family should have a plan for the following:

- The place of birth and how to get there including how to access emergency transportation if needed and referring to higher levels of care when appropriate
- Items needed for the birth (cloths, baby wraps, hate…)
- Money saved to pay for transportation, the skilled provider and for any needed medications and supplies that may not be provided for free
- Support during and after the birth (e.g., family, friends)
- Household prepares for care of other children whilst the mother is away.
- Companion to accompany her to the facility and stays to support her during labour and delivery;

## 6.1. Readiness plan

- Identifies transportation systems and where to go in case of emergency, support persons to accompany and stay with family
- Speaks out and acts on behalf of her and her child's health, safety and survival
- Knows that community and facility emergency funds are available
- Ensures personal savings and how to access it in case of need
- Chooses skilled attendant and place of birth in antenatal period.
- Recognizes normal labour and complications

## 6.2. Facility delivery:

### 6.2.1. Explain why birth in a facility is recommended

- Any complication can develop during delivery - they are not always predictable.
- A facility has staff, equipment, supplies and drugs available to provide best care if needed, and a referral system.

### 6.2.2. Advise how to prepare

- Review the arrangements for delivery

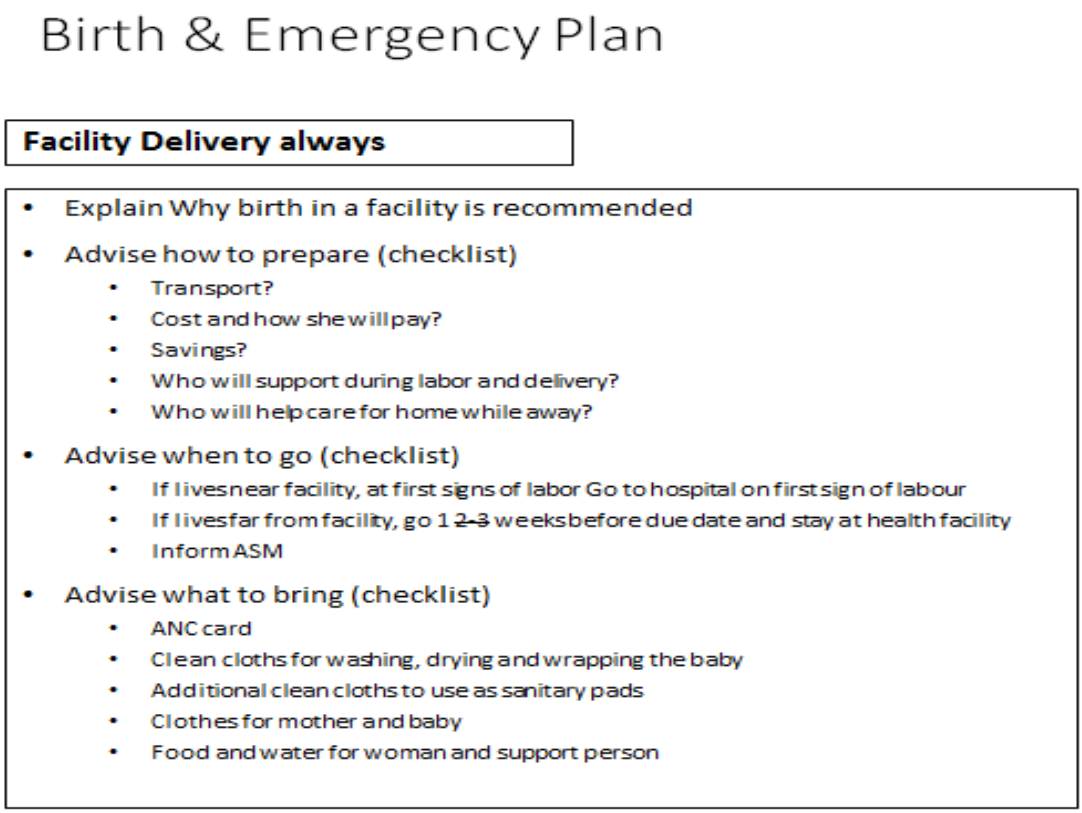
### 6.2.3. Advise when to go

- If the woman lives near the facility, she should go at the first signs of labour.
- If living far from the facility, she should go 1-2 weeks before expected date of delivery and stay either at the maternity waiting home or with family or friends near the facility.
- Advise to ask for help from the community, if needed.

### 6.2.4. Advise what to bring

- Home-based maternal record.
- Clean clothes for washing, drying and wrapping the newborn.
- Additional clean clothes to use as sanitary pads afterbirth.
- Clothes for mother and newborn.
- Food and water for woman and support person.
- Identify a birth companion to accompany her to the facility and stays to support her during labour and delivery;
- Household prepares for care of other children whilst the mother is away.

**Figure 8: Birth & Emergency plan**




# CHAPTER VII: NUTRITION IN PREGNANCY

## 3.7. Weight gain

Body mass index (BMI) is derived from a person's weight in kilograms divided by the square of height in meters ($kg/m^2$) and is a measure of body fat (refer to Annex 2 for BMI calculation).

Most normal gestational weight gain occurs after 20 weeks of gestation and the definition of "normal" is subject to regional variations but should take into consideration pre-pregnant body mass index (BMI). According to the Institute of Medicine classification[17],

- ✓ Women who are underweight at the start of pregnancy (i.e. BMI < 18.5 kg/m$^2$) should aim to gain 12.5–18 kg at the end of pregnancy;
- ✓ Women who are normal weight at the start of pregnancy (i.e. BMI 18.5–24.9 kg/m$^2$) should aim to gain 11.5–16 kg, overweight women (i.e. BMI 25–29.9 kg/m$^2$) should aim to gain 7–11.5 kg, and;
- ✓ Obese women (i.e. BMI > 30 kg/m$^2$) should aim to gain 5–9 kg.

Weight gain alone should not be used as the basis of estimating the nutritional risk but should be combined with other indicators like dietary intake, medical history and biochemical profile.

## 3.8. Healthy nutrition for pregnant women

Nutrition of the fetus begins at conception. To substantially reduce the risk of low birth weight and related stunting in children less than 2 years of age, it is important to counsel the pregnant woman for an adequate intake of energy from proteins, fats, carbohydrates, minerals and vitamins to meet maternal and fetal needs; good nutrition helps also the woman to be prepared to start breastfeeding latest one hour after birth and exclusively breastfeed up to 6 months of age. Health workers should dispel misconceptions and myths about certain foods in pregnancy. Food safety is also an essential component to be explained to pregnant women in order to prevent food intoxication.

Women's needs for energy and most nutrients increase during pregnancy and Breastfeeding Iron needs during pregnancy are so high that it is advisable to give iron supplements, such as iron/folic acid tablets. Make sure that women and their relatives know the following:
All girls and women of reproductive age should:

- Eat a healthy, balanced diet;
- Have plenty of clean, safe drinks (boiled water, soups, herbal tea);
- Eat iodized salt: women who lack iodine when they become pregnant are at greater risk of having a baby who is physically and mentally damaged.

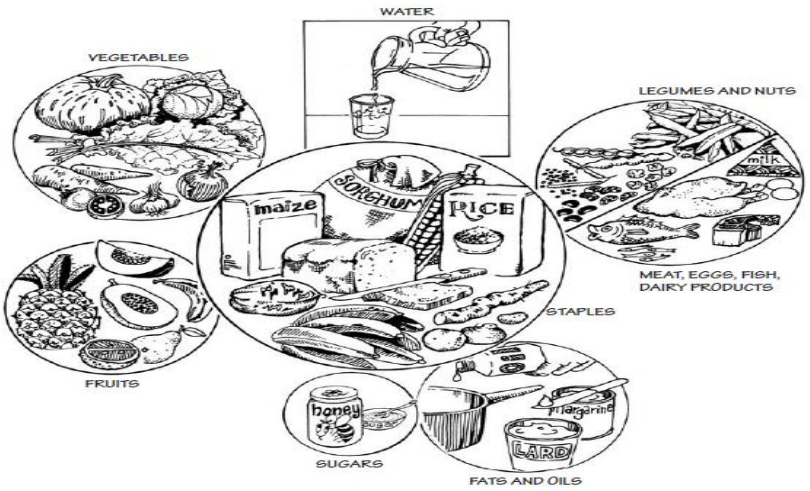
Pregnant and breastfeeding women and girls need extra food:

- When pregnant, they need about 280 extra kcal/day, more protein, zinc, vitamin A, vitamin C and folate, and much more iron (i.e. the equivalent of an extra nutritious snack each day). It is particularly important for women to eat well and be well nourished throughout their pregnancy, including the first trimester, so that the babies 'bodies and brains develop properly.
- When breastfeeding, they need about 450 extra kcal/day and much more protein, zinc, vitamin A, vitamin C and folate (i.e. the equivalent of an extra small meal each day). It is suggested that women eat more at each meal or eat more frequently-perhaps having more snacks during the day.

Women should eat well between pregnancies, so they rebuild their bodies 'stores of nutrients.
A woman who is overweight or obese when she becomes pregnant should eat healthy meals but not 'diet'. Advise her how to lose weight if she is still overweight after breastfeeding[18].

A healthy diet contains adequate energy, protein, vitamins and minerals, obtained through the consumption of a variety of foods, including green and orange vegetables, meat, fish, beans, nuts, whole grains and fruit. Pregnant women should receive three meals per day and additional healthy snacks using a variety of foods available locally, as per the food basket below:

**Figure 9: Recommended foods for pregnant woman**




Vegetables should not be overcooked, in order to not destroy the vitamins.

Examples **of healthy snacks include:**

- Pasteurized or boiled milk, fermented milk, yoghurt, cheese (prepared from boiled milk)
- roasted groundnuts, soybeans, pumpkins seeds and other oil seeds;
- Eggs;
- Fried small fish;
- Bread particularly when eaten with ghee or groundnut paste;
- Boiled or roasted maize cobs;
- Boiled or fried cassava, plantain, yam, sweet potatoes and potatoes;
- Chapatis, bean cakes;
- Bananas, avocados, mangoes, oranges and other fruits.

It is important that food should be prepared safely as per the "Five keys to safer food" (see annex 5):

- Keep clean;
- Separate raw and cooked;
- Cook thoroughly;
- Keep food at safe temperature and;

- Use safe water and raw materials.

It is essential that pregnant women do not use raw animal source products:

- Milk should be boiled or pasteurized;
- Diaries should be prepared from boiled milk;
- Meat, fish, eggs should be well cooked and
- Wash fruits and vegetable with clean water before using them. This will prevent listeria infection that can lead to unplanned abortions in pregnant women or death of newborn babies.
- Information to a pregnant woman and her family.

Before sharing information with families, you may need to find out:

- What women eat, what pregnant women eat, what breastfeeding women eat, what the food customs and taboos for menstruating, pregnant and breastfeeding women are.
- What types of malnutrition there are among women, especially pregnant and breastfeeding women?
- Whether adolescent pregnancy is a problem;
- Whether adolescent pregnant girls are undernourished;
- How many babies have low birth weights;
- What the causes of low birth weight are;
- What people believe are the causes of low birth weight;
- What the blocks to women having better diets are;
- Whether anemia and/or vitamin A deficiency disorders are problems in the area.

Before sharing information, you should:

- Prioritize and decide which information is most important to share with women and their families;
- Decide who to reach; for example: women and adolescent girls, women's partners and other relatives, relatives of adolescent girls.
- Choose communication methods; for example: discussions, handouts, demonstrations of good foods for women, quizzes, plays/drama and songs.

## 3.9. Key messages on nutrition for a positive pregnancy

- All pregnant women should be counseled on healthy eating for a positive pregnancy at each ANC contact. These messages should be reinforced by the CHWs during home visits.

- Pregnant women should receive 3 meals and at least one additional snack using diverse food types to improve the quality and micronutrient intake.
- Pregnant women should avoid coffee, energy drinks, Coca-Cola, alcohol, fatty foods, raw or undercooked meats in pregnancy.
- Pregnant women who are obviously malnourished need special attention, counselling and advice from a trained nutritionist or a trained health care provider;
- Adolescent girls who are pregnant have their own need for growth and additional needs for fetus growth. Adolescent girls who become pregnant need very special care with at least 3 meals and 2 snacks daily, using a variety of foods including animal source foods in every meal.

## 3.10. Physical activity

Health benefits of physical activity during pregnancy include reduced risk of excessive gestational weight gain and conditions such as gestational diabetes, preeclampsia, preterm birth, varicose veins, and deep vein thrombosis.

Women should be advised to maintain a good level of physical activity like walking and swimming; however, vigorous activity during pregnancy, such as heavy lifting and prolonged standing or bending, is not recommended.

## 3.11. Education for appropriate infant feeding

Health providers should discuss the importance and management of breastfeeding with all pregnant women and their families. All pregnant women must have basic information about breastfeeding, in order to make informed decisions.

Where facilities provide antenatal care, pregnant women and their families should be counselled about the benefits and management of breastfeeding.
The health facility could organize classes with practical sessions on breastfeeding and how to overcome breastfeeding difficulties.
The message given during antenatal discussion, group's education and communication materials should include at a minimum:

- Importance of breastfeeding;

- Exclusive breastfeeding for the first 6 months, the risks of giving formula or other breast-milk substitutes, and the fact that breastfeeding continues to be important after 6 months;
- Importance of immediate and sustained skin to-skin contact;
- Importance of early initiation of breastfeeding within one hour after birth;
- Importance of rooming-in;
- Basics of good positioning and attachment;
- Recognition of feeding cues;
- Importance of starting to give other foods at 6 months of age;
- Importance of gradually introducing a variety of foods from 6 months to one year;
- Importance of continuing to breastfeed the child up to 24 months;

If the mother's HIV test is positive, she should receive ARTs and be counselled and supported for infant feeding; the mother can breastfeed like for other infants, except that breastfeeding should gradually be interrupted at 18 months.

Practical skills such as positioning and attachment, on-demand feeding and recognizing feeding cues are a necessary component of antenatal counselling. Families should be presented with up to-date information on best practices in facilities providing maternity and newborn services regarding skin-to-skin contact, initiation of breastfeeding, supplementation protocols and rooming-in. Women also need to be informed about possible challenges they might encounter (such as engorgement, or a perception of not producing enough milk) and how to address them.

Antenatal breastfeeding counselling must be tailored to the individual needs of the woman and her family, addressing any concerns and questions they have. This counselling needs to be sensitively given and consider the social and cultural context of each family. Wherever possible, conversations on breastfeeding should begin with the first or second antenatal contact, so that there is time to discuss any challenges, if necessary. This is particularly important where pregnant women initiate their visits late in their pregnancy. Additionally, women who deliver prematurely may not have adequate opportunities to discuss breastfeeding if the conversations are delayed until late in pregnancy.

Information on breastfeeding should be provided in multiple ways. Printed or online information that is in a language mothers (including illiterate ones) understand is one way to ensure that all relevant topics are covered. However, there is no assurance that all women will read this information, and it may not

directly address the key questions they have. Interpersonal counselling, either one-on-one or in small groups, is important to allow women to discuss their feelings, doubts and questions about infant feeding.

The information must be provided free of conflicts of interest. As stipulated in the Guidance on ending inappropriate promotion of foods for infants and young children[19], companies that market foods for infants and young children should not "directly or indirectly provide education to parents and other caregivers on infant and young child feeding in health facilities".

Women at increased risk for preterm delivery or birth of a sick infant (e.g. pregnant adolescents, high-risk pregnancies, known congenital anomalies) must begin discussions with knowledgeable providers as soon as feasible concerning the special circumstances of feeding a premature, low-birth-weight or sick baby[20].

## 3.12. Micronutrient supplementation during pregnancy

During pregnancy, women have additional needs in all nutrients and micronutrients. For some micronutrients such as iron, folic acid and calcium, the needs are difficult to be covered by food intake alone and micronutrients supplements are needed.

### 3.12.1. Iron and folic acid supplementation

Pregnant women should be prescribed a daily dose of oral iron (60 mg) and folic acid supplementation (400µg =0.4 mg) during the whole course of pregnancy to prevent maternal anemia, puerperal sepsis, low birth weight, and preterm birth.

Intermittent oral iron and folic acid supplementation with 120 mg of elemental iron and 2800 mg (2.8 g) of folic acid once weekly is recommended for pregnant women to improve maternal and neonatal outcomes if daily iron is not acceptable due to side-effects.

If a woman is diagnosed with anemia during pregnancy, her daily elemental iron should be increased to 120 mg until her Hemoglobin concentration rises to normal (Hb: 110 g/L or higher). Thereafter, she can resume the standard daily antenatal iron dose to prevent recurrence of anemia.

### 3.12.2. Calcium supplementation

Given the insufficient intake of calcium in women in Rwanda (ref. Nutrition Market and Gender Analysis, RAB and partners, 2015), pregnant women should receive a daily calcium supplementation (1.5–2.0 g oral elemental calcium) to reduce the risk of pre-eclampsia.

Dividing the dose of calcium may improve acceptability. The suggested scheme for calcium supplementation is 1.5–2 g daily, with the total dose divided into three doses, preferably taken at mealtimes.

Negative interactions between iron and calcium supplements may occur. Therefore, the two supplements should preferably be administered several hours apart rather than concomitantly.

Calcium supplementation is recommended to woman with high risks to develop pre-eclampsia during pregnancy:

- Primigravidae, teenagers and elderly primigravidae.
- Women of age 35 years and above.
- Previous pregnancy complicated by pre-eclampsia.
- Previous abruptio placentae or intra-uterine death.
- Multiple pregnancies.
- Medical complications such as chronic hypertension, renal disorders, diabetes, connective tissue disorders or antiphospholipid syndrome

### 3.12.3. Promotion of iron, folic acid and calcium rich foods

In addition, it is important to advise mothers to daily take a variety of locally available foods (see paragraph 7.2 on healthy diet for pregnant women) including:

Iron rich foods such as fish, fish powder, offal (liver and others), meat, eggs (especially eggs yolk), combined with beans, soybeans,' ″isombe‟ or other green leaves;

Vitamin C (e.g. citrus fruits, guava, tomato tree, passion fruits) and vitamin A rich foods (e.g. orange flesh foods such as mangos, whole milk, butter, egg yolk, palm oil) when taking iron from foods or from supplements since it will enhance the iron absorption. It is also recommended to decrease the amount of tea which inhibits the iron absorption.

Calcium rich foods available locally such as milk, fermented milk, small fish or small fish powder should also be promoted.

Folates rich foods available locally should be taken daily, before and during pregnancy such as beans and groundnuts, dark green leave (″isombe‟ and other spinach), liver and kidneys, eggs, cereals.

# CHAPTER VIII: STANDARD PRECAUTIONS FOR INFECTION CONTROL AND PREVENTION

Health providers should adhere all the time to standard precautions for infection prevention and control to protect themselves and the client they serve.

## 8.1. Infection control and prevention

- Wear exam gloves for non-sterile procedures such as drawing blood or inspection of external genitalia;
- Wearing exam gloves for procedures such as vaginal exams and use a separate pair of gloves for each client to avoid cross-contamination;
- However, you should remove gloves to perform hand hygiene, when an indication occurs while wearing gloves; and you should wear gloves only when indicated otherwise they become a major risk for germ transmission;
- Instruments and other items used should be processed before storage: decontamination, cleaning and sterilization.

## 8.2. Hand washing

- Keep nails short and wash hands with soap and water for 40 -60 before and after seeing a client and whenever hands are visibly soiled. You can also use alcohol-based hand gels for 20-30 sec; wash also after contact with blood secretions, excretions or contaminated items/equipment.

## 8.3. House keeping

- Keep the procedure rooms (consultation room) and latrines clean with the help of a good housekeeping and waste disposal practices;
- Use detergent and water to remove dirt and organic materials and disinfectant to clean body fluids.

## 8.4. Waste management

- Using single-use syringes, needles, and lancets when giving injections or drawing blood and disposing of them after each use, avoiding re-capping needles;
- Disposing of needles and other sharps in puncture-proof containers and incinerating them when three quarters full;
- Disposing of used gloves and other contaminated items in leak-proof receptacles that will be buried or burned.

# CHAPTER IX: EARLY DETECTION AND RESPONDING TO COMPLICATIONS DURING PREGNANCY (INCLUDING REFERRAL)

## 9.1. Introduction

When complications arise, considerable and life-threatening delays occur as families try to mobilize funds and reach a facility where care is available.

Recognizing an emergency during pregnancy which requires immediate treatment and urgent referral to a higher-level facility is important to prevent maternal morbidity and mortality. During each visit health providers should perform a thorough evaluation of the pregnant woman for pre- existing or new-onset disease conditions that may affect the outcome of pregnancy require immediate treatment or require a higher level of care and follow-up.

### Table 3: Diagnostic and management of premature rupture of membranes

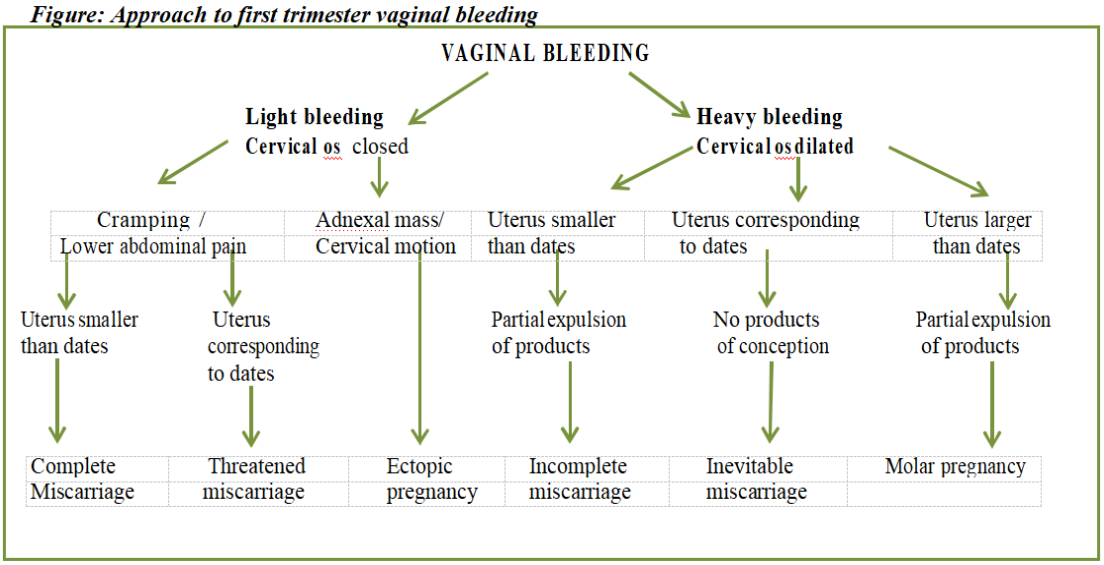
| Symptoms | Signs | Possible Diagnosis |
|---|---|---|
| **BEFORE 20 WEEKS OF GA** | | |
| - Persistent nausea, vomiting, weight loss | Dehydration, weight loss of 5 kg and above, urine analysis shows ketones 2+ or more | Hyperemesis gravidarum |
| - Vaginal bleeding with or without passage of clots and fleshy material,<br>- crampy lower abdominal pain | Tachycardia and or hypotension<br>Cervix may open | Abortion (All types of spontaneous abortions except missed abortion) |
| - Pregnancy symptoms disappear, Minimal dark vaginal bleeding | No increase in Uterine size, absent FHB, cervix closed | Missed Abortion |
| - Vaginal bleeding (menstrual-like), lower abdominal pain, missed or irregular period | Hypotension, pallor, abdominal tenderness | Ectopic pregnancy |
| - Vaginal bleeding (fresh), passage of tissues which look like an ice spoiled with blood (grape-like tissues), | Fast abdominal growth | Molar pregnancy |
| **AFTER 20 WEEKS OF GA** | | |
| - Headache, RUQ/Epigastric pain, blurred vision, | SBP > 140 and/or DBP > 90mmHg<br>Proteinuria > 1+ | Hypertensive disorders of pregnancy |
| - Sudden gush or intermittent leakage of watery vaginal fluid | Wet vulva, pad test, leakage on speculum examination | Prelabor Rupture of Membranes |

| Symptoms | Signs | Possible Diagnosis |
|---|---|---|
| - Leakage of fluid, abdominal pain, fever | Fever 38°C. Fetal tachycardia<br>Foul-smelling discharge.<br>Uterine tenderness | Uterine and<br>fetal infection (chorio-amnionitis) |
| - No change in abdominal growth, +/- fetal kick felt less than 10 times in 12 hours. | Small uterine size for gestational age<br>(no increase in symphysis fundal height) | Intrauterine fetal growth restriction (IUGR) |
| - Absent fetal kick for more than 6 hours | No FHB (Fetoscope) | Intrauterine fetal death (IUFD) |
| - Blood-stained mucus or watery vaginal discharge (show)<br>- Lower abdominal (pushing) pain before 37 weeks | - Cervical dilatation and effacement<br>- Contractions | Possible preterm labor, |
| - Bleeding, with or without abdominal pain | Blood at introitus, uterine contractions,<br>malpresentation,..FHB abnormalities | Antepartum hemorrhage (placenta praevia or Abruption placenta) |
| **THROUGHOUT PREGNANCY** | | |
| - Vaginal discharge<br>- No history of leakage of fluid<br>- Itching | Abnormal vaginal discharge (foul smelling, yellowish, curdy) on inspection or digital examination | Vaginitis (candidiasis, bacterial vaginosis.)<br>cervicitis (Gonorrhea, chlamydia,) |
| - Painful urination, urgency, pus or bloody urine<br>+<br>- Pain in the sides (flanks), fever, vomiting, | - Urinalysis: Leukocytes (> 5-10/HPF)<br>+<br>- Flank tenderness; WBC casts (U/A) | Urinary tract infections (UTIs, cystitis, urethritis)<br><br>Pyelonephritis |
| - Fever, headache, chills, rigor, sweating, feels thirsty, anorexia, generalized aching pain, | Fever, tachycardia, enlarged spleen<br>Suggestive Blood tests results | Malaria, typhoid or typhus fever, |
| - Loss of appetite, RUQ pain, exhaustion, nausea and vomiting | Yellowish discoloration of the eyes, tender liver | Hepatitis |
| - Easy tiredness, breathlessness, palpitation, headache, vertigo | - Pallor + Haemoglobin 7-11 g/dl.<br>- Tachycardia, tachypnea (> 30 breaths per minute) +<br>Haemoglobin < 7 g/dl. | Moderate Anemia<br><br>Severe anemia |

## 9.2. Vaginal bleeding in early pregnancy

Bleeding in early pregnancy is defined as vaginal bleeding that occurs within the first 22 weeks of gestation. It is one of causes of obstetric hemorrhage which is leading cause of maternal mortality in Rwanda. This justifies to always assessing bleeding in ANC. The differential diagnosis includes abortion (threatened miscarriage, inevitable miscarriage and complete miscarriage), ectopic pregnancy and gestational trophoblastic disease (molar pregnancy). In all cases follow the steps below for diagnosis and Management:

### Figure 10: Vaginal bleeding in early pregnancy




### 9.2.1. Principles of management of threatened miscarriage

- Take vital signs: pulse, blood pressure and hemoglobin
- If not anemic, advise for:
  - ✓ bed rest
  - ✓ avoid intercourse
- Review every week until symptoms resolve.
- If any complication, advise the pregnant woman to come back immediately for review

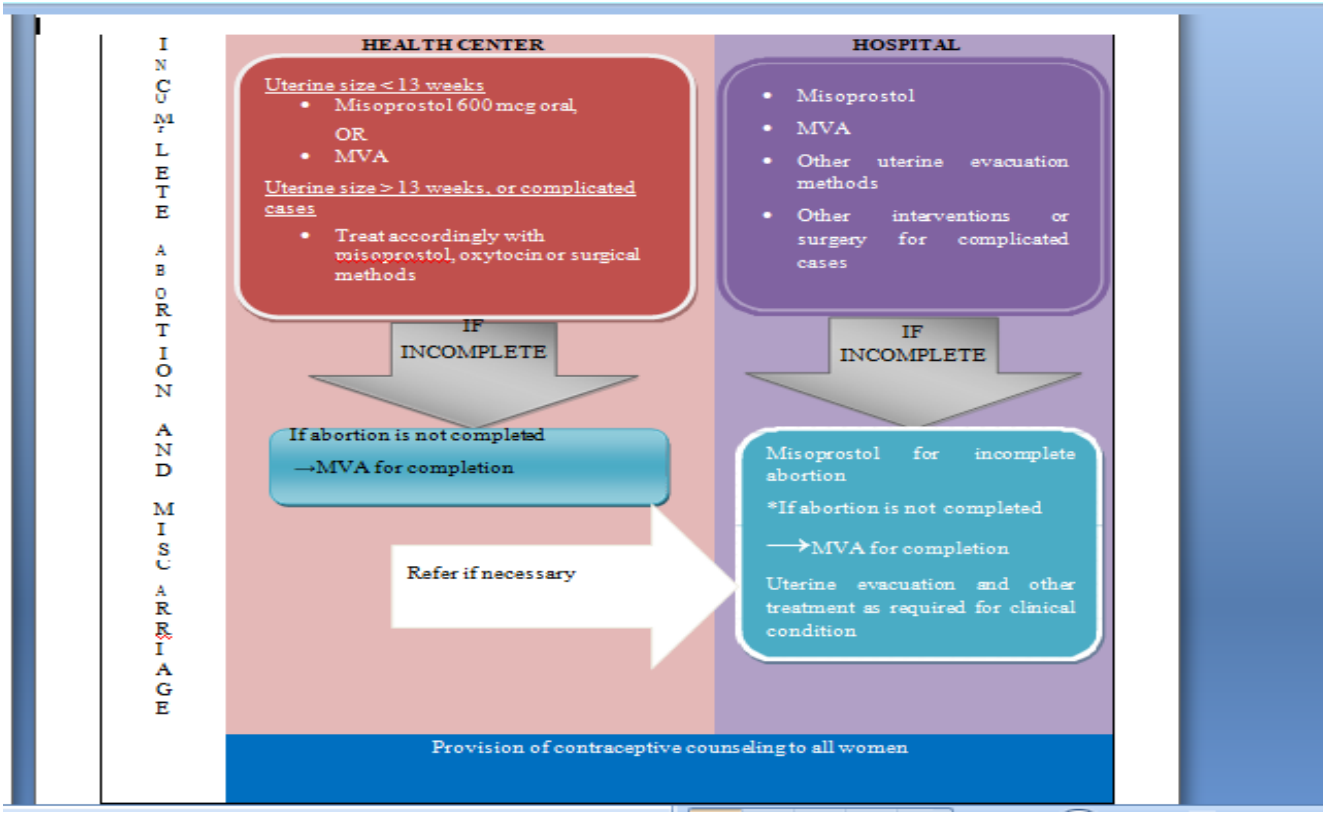
If **bleeding persists**, assess for fetal viability (pregnancy test/ultrasound) or ectopic pregnancy (ultrasound). Persistent bleeding, particularly in the presence of a uterus that is larger than expected, may indicate twins or molar pregnancy.

**Note:** Medical treatment is usually not necessary for management of threatened miscarriage.

Management of types of bleeding in early pregnancy should be done in Emergency Obstetric Care services**.**

### 9.2.2. Principles of integrated treatment of incomplete abortion and miscarriage at different levels

**Figure 11: Principles of integrated treatment of incomplete abortion and miscarriage at different levels**




## 9.3. Vaginal bleeding in late pregnancy

### 9.3.1. Introduction

Bleeding in late pregnancy (antepartum hemorrhage) is defined as vaginal bleeding that occurs after 22 weeks of gestation. Always assess bleeding at each ANC contact.

The main cause of the bleeding in late pregnancy is placenta praevia. The vaginal bleeding in labor is the bleeding that occurs in labor but before delivery. The main cause of vaginal bleeding in late pregnancy (and in labor) is placental (Placenta praevia and Abruptio placentae) and uterine rupture (especially during labor). Rare cause may be vasa praevia and other placental abnormalities.

### 9.3.2. Diagnosis of bleeding in late pregnancy and in labor

**Table 4: Diagnosis of bleeding in late pregnancy and in labor**

| **Presenting Symptom and Other Symptoms and** | **Symptoms and Signs Sometimes Present** | **Probable Diagnosis** |
|---|---|---|
| • Bleeding after 28 weeks gestation (may be retained in the uterus)<br>• Intermittent or constant | • Shock<br>• Tense/tender uterus<br>• Decreased/absent fetal movements<br>• Fetal distress or absent fetal heart sounds | **Abruptio placentae,** |
| • Bleeding (intra-abdominal and/or vaginal)<br>• Severe abdominal pain (may decrease after rupture) | • Shock<br>• Abdominal distension/ free fluid<br>• Abnormal uterine contour<br>• Tender abdomen<br>• Easily palpable fetal parts<br>• Absent fetal movements and fetal heart sounds | **Ruptured uterus,** |
| • Bleeding after 28 weeks gestation,<br>• No pain | • Shock<br>• Bleeding may be precipitated by sexual intercourse<br>• Relaxed uterus<br>• Fetal presentation not in pelvis/ lower uterine pole feels empty | Placenta Praevia, |

### 9.3.3. General Management:

- **SHOUT FOR HELP**. Urgently mobilize all available personnel.
- Make a rapid evaluation of the general condition of the woman including vital signs (pulse, blood pressure, respiration, temperature).
- If shock is suspected, immediately begin treatment. Even if signs of shock are not present, keep shock in mind as you evaluate the woman further because her status may worsen rapidly.
- Start an IV infusion and infuse IV fluids (e.g. Ringers lactate or Normal Saline).

- All cases with bleeding in late pregnancy or during labor should be rapidly assessed and referred in Emergency obstetric care for further management
- If the diagnosis is ruptured uterus (in addition to the above care and before referral):
    - Catheterize bladder
    - Give loading dose of triple antibiotic
        - Ampicillin 2 gm IV stat
        - Metronidazole 500mg, and
        - Gentamycin 80mg IV stat

**Note**: - Tachycardia should be taken seriously even in a stable looking patient
- For vaginal bleeding in late pregnancy do not perform vaginal examination until placenta praevia is ruled out.

## 9.4. Hypertensive disorders in pregnancy

Hypertensive disorders are potentially serious complications of pregnancy with increasing significance worldwide

### 9.4.1. Types of hypertensive disorders of pregnancy

#### *9.4.1.1. Chronic Hypertension*

Hypertension that is present before 20 weeks of gestation or if the woman was already taking antihypertensive medication before the pregnancy. Chronic hypertension is defined as hypertension that antedates pregnancy, is present before the $20^{th}$ week of pregnancy, or persists longer than 12 weeks postpartum.

Hypertension: A diastolic blood pressure ≥ 90 mmHg but < 110 mmHg on two occasions, taken at least 2 hours apart, or a single diastolic measurement of ≥ 110 mmHg AND/OR A systolic blood pressure ≥ 140 mmHg but < 160 mmHg on two occasions, taken at least 2 hours apart, or a single systolic measurement of ≥ 160 mmHg.

**Care during pregnancy**

- If the woman was on an antihypertensive medication before pregnancy and her blood pressure is well-controlled, continue the same medication if acceptable in pregnancy or transfer to medication safely used in pregnancy.
- If the systolic blood pressure is 160 mmHg or more or the diastolic blood pressure is 110 mmHg or more, treat with antihypertensive medications (See table for medication).
- If proteinuria or other signs and symptoms of pre-eclampsia are present, consider superimposed pre-eclampsia and manage as pre-eclampsia.
- Monitor fetal growth and condition through routine Antenatal care.
- If **pre-eclampsia develops**, manage as mild pre-eclampsia or severe pre-eclampsia.
- If there are **no complications**, the following approach for timing of delivery is used:
    - ✓ ≥ 38+0 to 39+0 weeks of gestation for women not requiring medication
    - ✓ ≥ 37+0 to 39+0 weeks for women with hypertension controlled with medication
    - ✓ Late preterm delivery (34+0 to 36+6 weeks) for women with severe hypertension difficult to control

#### *9.4.1.2. Gestational Hypertension:*

New onset of hypertension presenting only after 20 weeks of gestation without significant proteinuria.

**Pre-eclampsia superimposed on chronic hypertension**

Evidenced by the new onset of persistent proteinuria in a woman who had an initial diagnosis of chronic hypertension. It is diagnosed when a woman with chronic hypertension develops worsening hypertension with new onset proteinuria or other features of preeclampsia (e.g., elevated liver chemistries, low platelet count).

**Pre-eclampsia**

Hypertension with significant proteinuria developing for the first time after 20 weeks of gestation. In other words, it refers to the syndrome of new onset of hypertension and proteinuria or **new onset of hypertension and end-organ dysfunction with or without proteinuria**, most often after 20 weeks of gestation in a previously normotensive woman. ***Significant proteinuria***: The presence of 1+ or more

proteinuria on a test strip (dipstick) in a clean catch urine specimen on 2 occasions, at least 2 hours apart. Test for proteinuria in all antenatal patients using bed side tests.

- **Mild to moderate pre-eclampsia (also known as preeclampsia without severe features)**: a diastolic BP of 90-109 mmHg and/or systolic blood pressures of 140-159 mmHg, with 1+ proteinuria; and no organ dysfunction.
- **Severe pre-eclampsia (preeclampsia with severe features):** Acute severe hypertension (diastolic BP of 110 mmHg and/or systolic of greater than 160 mmHg) with 1+ proteinuria OR Systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg (with or without proteinuria) and one or more of the following signs and symptoms of significant end organ dysfunction:
- Platelet count < 100,000/microL
- Serum creatinine > 1.1 mg/dL (97.2 micromole/L) or doubling of the creatinine concentration in the absence of other renal disease
- Severe, persistent right upper quadrant or epigastric pain unresponsive to medication and not accounted for by an alternative diagnosis or Liver transaminases at least twice the upper limit of the normal concentrations for the local laboratory
- Pulmonary edema
- Cerebral or visual symptoms (e.g., new-onset and persistent headaches not accounted for by alternative diagnoses and not responding to usual doses of analgesics; blurred vision, flashing lights or sparks, scotomata)

**Eclampsia**

Generalized tonic-clonic seizures after 20 weeks of pregnancy and within 7 days after delivery, associated with hypertension and proteinuria.

### 9.4.2. Management of hypertensive disorders of pregnancy

#### *9.4.2.1. Gestational hypertension*

- Manage on an outpatient basis:
- Monitor blood pressure, urine (for proteinuria) and fetal condition weekly.
- If blood pressure worsens or the woman develops features of pre-eclampsia, manage as pre-eclampsia
- If there are signs of severe fetal growth restriction or fetal compromise, admit the woman to the hospital for assessment and possible expedited birth

- Counsel the woman and her family about danger signs indicating severe pre-eclampsia or eclampsia.

**Timing of delivery for gestational hypertension**

If all **observations remain stable**, allow to proceed with spontaneous labor and childbirth.
In women with gestational hypertension, if **spontaneous labor has not occurred before term**, induce labor at 37+0 to 38+6 weeks for all women with any degree of gestational hypertension because of the risk of progression to preeclampsia.

#### *9.4.2.2. Mild Pre-Eclampsia (Preeclampsia without Severe Features)*

**Gestation less than 34 + 0/7 weeks or late preterm (34 to 36 weeks)**

- Patients should be referred to a referral hospital for management
- As long as the well-being of the mother and fetus remains stable, the goal is for the woman to deliver at 37 + 0/7 weeks of gestation while monitoring of maternal and fetal status continues. However, it is important to remain vigilant because pre-eclampsia may progress rapidly to severe pre-eclampsia. The risk of complications, including eclampsia, increases greatly once pre-eclampsia becomes severe. Close monitoring and a high suspicion for worsening disease are important.
- If blood pressure **and signs of pre-eclampsia remain unchanged or normalized**, follow up with the woman as an outpatient twice a week:
- Monitor blood pressure, reflexes and fetal condition.
- Monitor for danger signs associated with features of severe pre-eclampsia (see signs of severity).
- Counsel the woman and her family about danger signs associated with severe pre-eclampsia or eclampsia.
- Do not give anticonvulsants or antihypertensives unless clinically indicated (see severe pre-eclampsia and eclampsia
- Steroids are recommended less than 34 weeks.
- If **follow-up as an outpatient is not possible**, admit the woman to the hospital:
- Monitor blood pressure (four to six times daily) and urine for daily output.
- Do not give anticonvulsants unless blood pressure increases or other signs of severe pre-eclampsia appear (see severe pre-eclampsia and eclampsia).
- Monitor for danger signs associated with severe pre-eclampsia.
- Advise her to watch for symptoms and signs of severe pre-eclampsia like

- ✓ Headache (increasing frequency, unrelieved by regular analgesics)
- ✓ Vision changes (e.g. blurred vision)
- ✓ Oliguria (passing less than 400 mL urine in 24 hours)
- ✓ Upper abdominal pain (epigastric pain or pain in right upper quadrant)
- ✓ Difficulty breathing (rales on auscultation of lungs due to fluid in lungs)
- ✓ Nausea and vomiting

Follow the woman twice weekly to monitor blood pressure and fetal well-being and to assess for symptoms and signs of severe pre-eclampsia.

***NB: If systolic blood pressure is 160 mmHg or higher and/or diastolic blood pressure is 110 mmHg or higher, or if signs of severe pre-eclampsia appear, even if her blood pressure is normal, admit the woman and follow recommendations for management of severe pre-eclampsia and eclampsia***

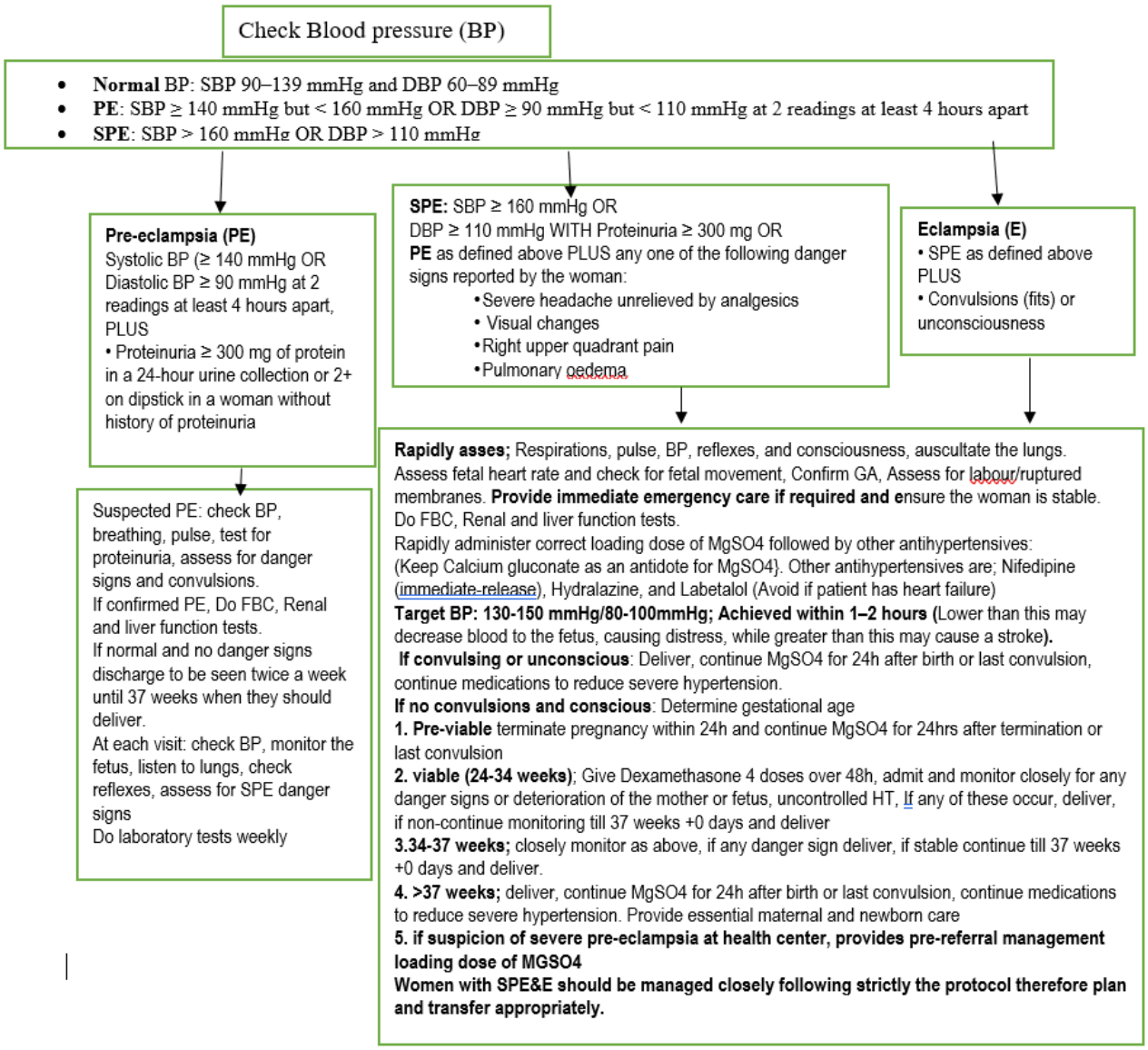
**Gestation at or more than 37 + 0/7 weeks**

The women should be referred for immediately for induction of labor after assessment of the cervix and induce or augment labor.

**Severe Pre-Eclampsia and Eclampsia**

Severe pre-eclampsia should be managed at hospital level and are managed similarly, except that birth must occur within 12 hours of onset of convulsions in eclampsia.

## Figure 12: Algorithm for the management of preeclampsia




## 9.5. Hyperemesis Gravidarum

Hyperemesis gravidarum describes nausea and vomiting that is severe enough to cause fluid and electrolyte disturbances, and often requires hospitalization.

It affects up to 1% of pregnant women and is associated with persistent vomiting (more than three episodes per day) that results in severe dehydration, Ketonuria, electrolyte abnormalities such as hypokalemia, and weight loss of more than 5%. Hyperemesis gravidum should be managed at hospital level.

### 9.5.1. Causes / Pathogenesis

The cause is unknown, but there are some implicated theories:

- ✓ Emotional: Various psychological, family conflicts, prior hyperemesis and social factors are associated with hyperemesis
- ✓ Hormonal: High levels of β human chorionic gonadotrophin (β hCG), progesterone and estrogen like in multiple pregnancy and Hydatiform mole.
- ✓ Mechanical: There is a fall in lower esophageal pressure, decreased gastric peristalsis and gastric emptying in pregnancy
- ✓ Endocrine disorders (Hyperthyroidism)

### 9.5.2. Signs and Symptoms

- ✓ Nausea and vomiting, typically in early pregnancy
- ✓ Dehydration
- ✓ Altered general status (Fast pulse, restlessness)
- ✓ Weight loss

### 9.5.3. Complications

- ✓ Metabolic disorder (hyponatremia, hypokalemia, metabolic hypochloraemic alkalosis, ketonuria) that may lead to coma
- ✓ Mallory-Weiss tears
- ✓ Neurological disorder (Wernicke's encephalopathy)
- ✓ Depression
- ✓ Cachexia
- ✓ Pregnancy termination
- ✓ Death

### 9.5.4. Investigations

- ✓ Full Blood count
- ✓ Blood for urea, electrolytes and serum creatinine
- ✓ Urinalysis, urine culture
- ✓ Liver function tests
- ✓ Thyroid function tests
- ✓ Obstetric ultrasound

### 9.5.5. Management

***Non-pharmaceutical management***

- Admit
- Monitor diuresis each 4 hours for 24-48 hours
- Monitor electrolytes for 24-48 hours
- Dietary modifications such as avoidance of large meals and consumption of low-fat, low-fiber, bland foods (e.g., breads, cereals, eggs, tofu, lean meat, peanut butter, fruits, vegetables)
- Avoidance of foods with strong smells and those with increased protein and liquid
- Family support with counselling involving the husband about self-recovery

***Pharmaceutical management***

- Intravenous rehydration: Alternate Ringers lactate with Normal Saline according to daily fluid needs and severity.
- Vitamin B-1 (Thiamine) 100 mg per day in intravenous rehydration solution.
- Antiemetics
  - ***First choice***
    - ✓ Metoclopramide: IM 5-10 mg TDS till cessation of vomiting, always associate with Pyridoxine hydrochloride: IV or PO 10-25 mg TDS
  - ***Alternative Treatment:***
    - ✓ Administer one of the following medicines:
      - ✓ Chlorpromazine: 12.5-25 mg IM/IV/PO three times daily
      - ✓ H-1 blockers (Meclizine 20 mg Tabs once daily or twice daily if needed)
      - ✓ Ondansetron (Emitino) 4 mg IV/PO two or three times daily
      - ✓ Domperidone (Motilium) PO 10mg three times daily or 60mg per rectal two times daily
    - ✓ If available Doxylamine 10 mg/pyridoxine 10 mg (Diclegis): Initial: Two tablets at bedtime on day 1 and 2; if symptoms persist, take 1 tablet in morning and 2 tablets at bedtime on day 3; if symptoms persist, may increase to 1 tablet in morning, 1 tablet mid-afternoon, and 2 tablets at bedtime on day 4 [maximum: doxylamine 40 mg/pyridoxine 40 mg (4 tablets) per day].
    - ✓ Doxylamine 20 mg/pyridoxine 20 mg (Bonjesta): Initial: One tablet at bedtime on day 1;

if symptoms persist on day 2, increase to 1 tablet in morning and 1 tablet at bedtime (maximum: doxylamine 40 mg/pyridoxine 40 mg (2 tablets) per day.

#### 9.5.6. Recommendations

Reassure the mother that the condition is physiological and will usually pass after the first trimester of pregnancy.

- Glucose may precipitate Wernicke's encephalopathy. Use of glucose 5% should be avoided, and if given, associated with thiamine 100 mg once daily either orally or intravenous
- Exclude other etiologies (e.g. infection, hyperthyroidism) before treatment and manage risk factors

### 9.6. Premature rupture of membranes

Premature rupture of membranes (PROM) is rupture of the membranes before labour has begun with the drainage of amniotic through the cervical canal.

PROM may occur before 37 weeks of gestation (preterm) and it is called PPROM or PROM at term (post 37 weeks of gestation).

**Note**

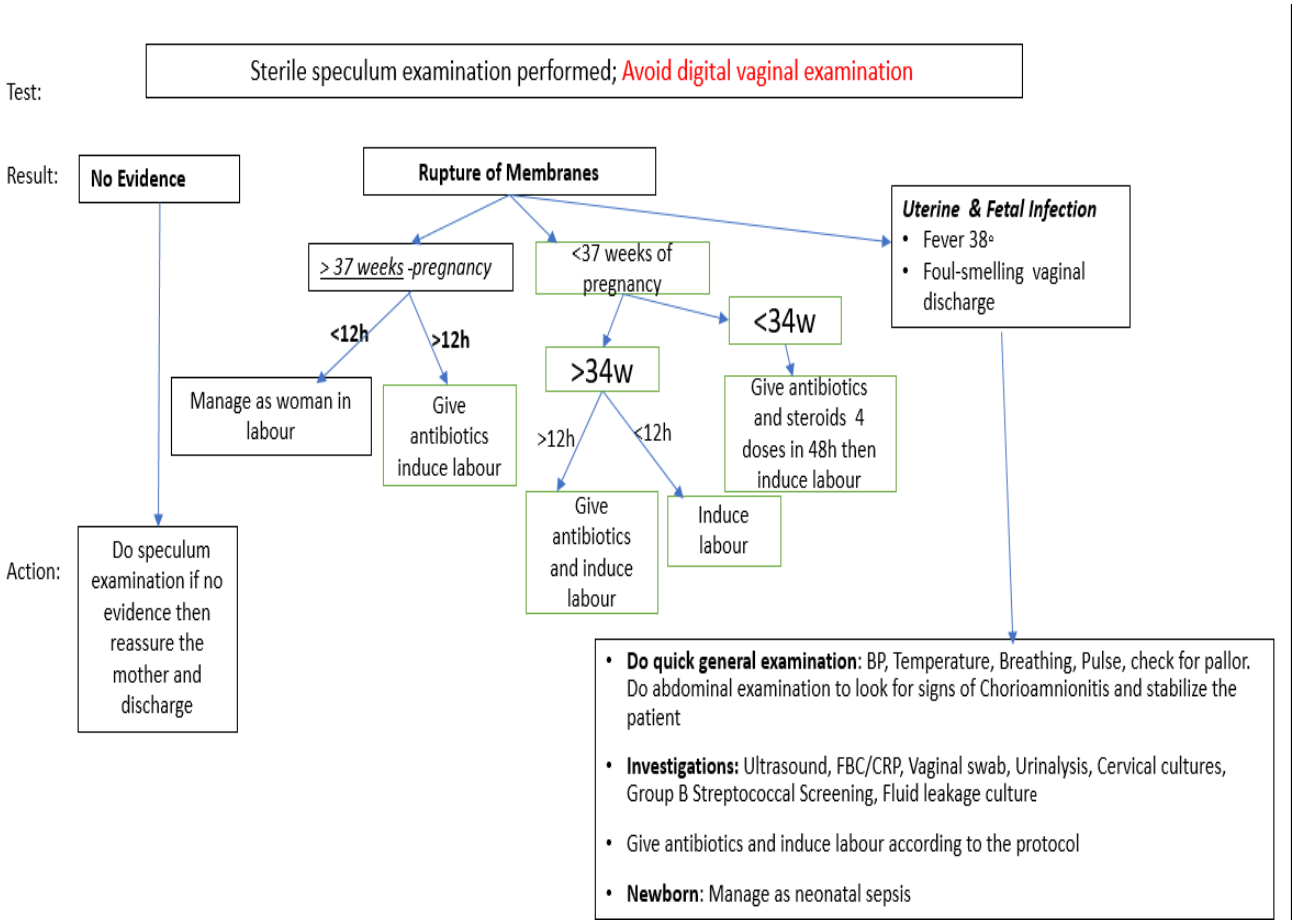
**It is important that the gestational age is accurately assessed (ideally confirmed by ultrasound scan in early pregnancy) and rupture of membranes confirmed in order to avoid inadvisable corticosteroid and antibiotic administration.**

### Table 5:Diagnostic and management of premature rupture of membranes

| Topic | Plan |
|---|---|
| ***General care*** | • Admit patient to antenatal ward or labour ward<br>• Monitor for uterine contraction and fetal heart rate<br>• Check maternal pulse and temperature every 4 hours.<br>• Assess for signs of labour, chorioamnionitis and placental abruption at least daily<br>• US for presentation, fetal anatomy and liquor volume |
| ***PROM > 12 hours at term (> 37 weeks)*** | • Start Ampicillin 2g every 6 hours up to delivery<br>• FBC, blood group & Rh<br>• Induce/augment labour as indicated (depending on bishop score) using appropriate techniques. |
| ***PPROM 34+1 to 36+6 weeks*** | • Manage as PROM > 37 weeks |
| ***PROM 24 to 33+6 weeks*** | • Send investigations: urine dipstick, urine culture if available, FBC<br>• Prophylactic antibiotics: If in labour administer Ampicillin as above for 48 hours and Erythromycin 500mg thrice daily for 48 hours:<br>• If labour ceases, continue Erythromycin 500mg and Amoxicillin 500 mg 8 hourly for 5 days to prolong latency<br>• In case of Penicillin allergy Give Azithromycin 1 gram orally upon admission, PLUS<br>• Clindamycin 900 mg IV every 8 hours for 48 hours,<br>• Replace Clindamycin with erythromycin<br>• PLUS<br>FOLLOWED BY<br>• If labour ceases, Clindamycin 300 mg orally every eight hours for five days<br>• **Tocolyse** if no signs of chorioamnionitis as per protocol for 48 hours to allow time for administration of steroids. Otherwise, if signs of infection present, delivery should be expedited.<br>• **Steroids for lung maturation**: dexamethasone 6 mg IM BD x 4 doses or Betamethasone 12 mg every 24 hours for a total of 2 doses<br>• **MgSO4 for fetal neuroprotection** (for 24-32weeks) 4 g loading over 20 minutes and a maintenance dose of 1 g/hour. We administer magnesium sulfate to women whom we believe will deliver within 24 hours: should contractions cease, MgSO4 should be stopped. |

| Topic | Plan |
|---|---|
| | **Monitoring**<br>• Twice weekly Biophysical profile and fetal monitoring<br>• Monitor Maternal vital signs (temp, HR, RR) every 4 hours<br>• Monitor for signs of Chorioamnionitis (fundal tenderness, foul smelling/purulent liquor, fever, fetal tachycardia) and if present, expedite delivery<br>• **Deliver at >34 weeks gestation** (induce labour, or CS if indication of labour contraindicated) unless there are signs of Chorioamnionitis prior to this |
| ***PPROM <24weeks*** | • The risks and benefits of expectant management versus pregnancy termination should be discussed.<br>• Counsel the woman about termination of pregnancy as per protocol (induction/and or augmentation of labour) |
| ***PPROM with signs of infection (Chorioamnionitis)***<br>• ***Fever,***<br>• ***Tender abdomen,***<br>• ***Foul smelling vaginal discharge and fetal distress)*** < ***34 weeks of gestation*** | • **Labour induction with Oxytocin**, 5 IU in glucose 5% 500 ml or Cytotec based on Bishop Score.<br>• **Antibiotic therapy**<br>**Ampicillin 2 g** IV every six hours<br>PLUS<br>**Gentamicin 5 mg/kg** IV once daily<br>PLUS<br>**Metronidazole IV 500mg** TDS<br>**Penicillin Allergy:** Clindamycin + Gentamicin + Metronidazole<br>• Antibiotics can be continued until at least 48 hours of symptom free period. Women with persistent fever and/or pelvic pain after 48 hours should be evaluated and treated for postpartum endometritis<br>• Continuous fetal monitoring recommended if available or Intermittent fetal monitoring at least every 30mins until delivery<br>• If fever (> $37^{o}$ C) give Paracetamol 500mg. Reduction of intrapartum fever with antipyretics reduces fetal tachycardia, thereby avoiding the tendency to perform a cesarean delivery because of an abnormal fetal heart rate pattern. |

**Figure 13: Algorithm for Pre-labour Rupture of Membranes**




## 9.7. Anemia during pregnancy

### 9.7.1. Definition

Anemia in pregnancy is defined as Hb < 11 g/dL (severe anemia as Hb < 7 g/dL) at any gestational age. Iron deficiency and acute blood loss are the most common causes of anemia in pregnancy, but other causes should be considered with severe anemia.

Anemia is generally defined as hemoglobin level less than 11g/dl or specifically:

- ✓ **HB <11g/dL** in 1st trimester
- ✓ **HB <10.5g/d**L in 2nd trimester
- ✓ **HB <11g/d**L in 3rd trimester

### 9.7.2. Symptoms and signs

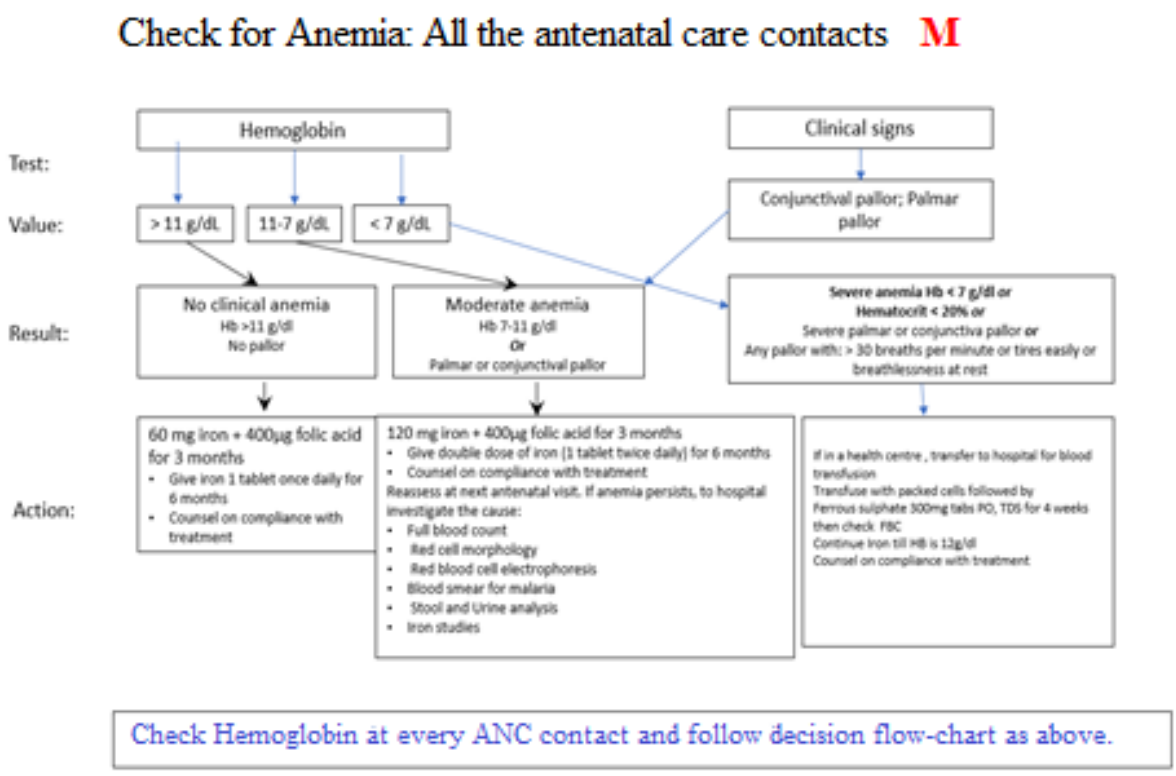
- History: Easy fatigability, headache, palpitations, PV bleeding
- Physical Exam: Pallor, tachycardia, +/- jaundice, +/- splenomegaly petechial

**Investigations**

- Point-of-care Hb/Full blood count to determine severity immediately;
- Malaria RDT (or peripheral smear),
- Stool for ova, parasites and occult blood

### 9.7.3. Management

**Figure 14: Algorithm for checking anemia during ANC**



Approach to anemia.

If Hb < 7 g/dL, especially if symptomatic, then blood transfusion. Transfuse rapidly in anaemia due to acute blood loss.

Transfuse slowly if chronic anaemia (Consider use of diuretics like Lasix 20- 40mg stat as necessary to reduce risk of congestive cardiac failure due to sudden circulatory overload).

- IF Hb is < 7 and asymptomatic manage according to clinician judgement treat the cause + Fe supplement
- If Hb < 8 g/dL, treat as per FBC results
  - If MCV < 80, then send blood for iron studies (ferritin, TIBC and % saturation (% sat) if available.
  - If MCV 80-93, then send blood for peripheral smear and consult hematologist
  - If MCV ≥ 94, then treat for folate or vitamin B12 deficiency
- If Hb > 8 g/dL, then treat with folate and $FeSO_4$ 325 mg PO BD and recheck Hb in 2-4 weeks
- Treat with Albendazole
- Treat for malaria or schistosomiasis if indicated
- Mixed anemia may occur and complicate laboratory findings
- If iron deficiency, then treat with elemental iron 200 mg PO OD. Titrate up to reduce side effects and encourage compliance. Take iron on empty stomach with vitamin C and without antacids.
- If folate deficiency, then treat with folate 1 mg PO OD.
- If vitamin B12 deficiency, then treat with vitamin B12 1000 mg IM monthly.
- If hemolytic anemia, then send blood for direct and indirect Coombs tests.
- Treat with corticosteroids. Of note, drug-induced (i.e. methyldopa, penicillin, cephalosporin) hemolytic anemia is typically milder and is treated by stopping the offending medication.

## 9.8. Cervical Insufficiency

### 9.8.1. Definition

The inability of the uterine cervix to retain a pregnancy in the second trimester in the absence of clinical contractions, labor, or both, often repetitive and caused by cervical weakness.

**Note**: All suspected cases of cervical insufficiency should be managed by an obstetrician.

### 9.8.2. Risk factors

- Functional or structural defect of the cervix
- Prior cervical trauma (e.g. repeated cervical dilatation and curettage and other cervical surgical procedures e.g. loop excision of cervix)
- Uterine anomalies (congenital cervical hypoplasia or aplasia)
- In utero diethylstilbestrol exposure

### 9.8.3. Signs and Symptoms

- Recurrent mid trimester losses without contractions with a live fetus
- Premature rupture of membranes

### 9.8.4. Complications

- Habitual loss of the fetus
- Premature Pre-labour
- Rupture of membranes
- Prematurity
- Infection (chorioamnionitis)
- Depression

### 9.8.5. Diagnosis

- Usually based on either a classic past obstetric history (2 consecutive pregnancy losses in the second trimester) or on a combination of obstetric history and transvaginal ultrasound measurement of cervical length < 25 mm prior to 27 weeks on ultrasound.
- The diagnosis is usually limited to singleton gestations, because the pathogenesis of second-trimester pregnancy loss/extremely preterm delivery (i.e., < 28 weeks) in multiple gestations is usually unrelated to a weakened cervix.

## 9.9. Thromboembolic disease in pregnancy and the puerperium

### 9.9.1. Introduction

Pregnancy and the puerperium are well-established risk factors for deep vein thrombosis (DVT) and pulmonary embolism (PE), which are collectively referred to as venous thromboembolic disease (VTE).

VTE can manifest during pregnancy as an isolated lower extremity deep vein thrombosis (DVT) or clot can break off from the lower extremities and travel to the lung to present as a pulmonary embolus.

### 9.9.2. Risk factors

- Pregnancy, in itself, is a risk factor for the development of venous thromboembolism (VTE)
- Increased risk for VTE is highest in the postpartum period, with a higher than usual prevalence of clot in the left lower extremity and pelvis.
- Antepartum: Factors that increase the risk of VTE antepartum are less well described but include the following:
    - Multiple births
    - Varicose veins
    - Inflammatory bowel disease
    - Diabetes
    - Hospitalization for non-delivery reasons (particularly those hospitalized for >3 days)
    - Body mass index (BMI) $\geq 30$ kg/m$^2$
    - Increased maternal age $\geq 35$ years
- Postpartum: the risk is highest in the first six weeks postpartum and declines to rates that approximate that of the general population by about 13 to 18 weeks. Commonly cited factors that increase the risk of VTE postpartum include the following:
    - Cesarean section (CS), especially emergent CS
    - Medical comorbidities (e.g., varicose veins, cardiac disease, inflammatory bowel disease)
    - BMI $\geq 25$ kg/m$^2$

- Obstetric hemorrhage (APH or PPH)
- Increased maternal age ≥ 35 years
- Hypertension
- Smoking
- Eclampsia or pre-eclampsia

- Anatomic location of deep vein thrombosis (DVT): The majority of lower extremity DVTs during pregnancy is left-sided. In addition, the incidence of pelvic vein thrombosis is significantly higher during pregnancy and the puerperium, although DVT is still most often found in the proximal veins (e.g., femoral vein).
- Left lower extremity DVT – DVT is predominantly left-sided in pregnancy (70 to 90 percent). This striking distribution has been attributed to increased venous stasis in the left leg related to compression of the left iliac vein by the right iliac artery, coupled with compression of the inferior vena cava by the gravid uterus.

### 9.9.3. Signs and symptoms

**History** - DVT should be suspected in patients who present with leg swelling, pain, warmth, and erythema.

**Physical exam** may reveal

- Dilated superficial veins
- Unilateral edema or swelling with a difference in calf or thigh diameters
- Unilateral warmth, tenderness, erythema
- Pain and tenderness along the course of the involved major veins
- Homans' sign (calf pain on passive dorsiflexion of the foot) may be present

## 9.10. Intrauterine Growth Restriction

### 9.10.1. Introduction

Intrauterine Growth Restriction (IUGR) is a fetal weight that is below the 10th percentile for gestational age as determined through an ultrasound. IUGR can be classified into two main groups:

- **Symmetric** - the head and body both show growth failure. This may result from genetic or chromosomal defects, intrauterine infection or exposure to teratogenic substances. Liquor

volume is usually normal.

- Asymmetric - the head grows, but the body shows growth failure. This is usually associated with placental insufficiency. This may result from pre-eclampsia or vascular disease (as in diabetes or lupus). Liquor volume may be reduced.
- Some fetuses may appear symmetrically growth impaired, but are normal small babies, or may be suspected to be small because of wrong pregnancy dates.

### 9.10.2. Screening

Identifying pregnant women at risk

- Hypertensive disorders
- History of previous IUGR or low birth weight babies
- History of previous abruptio placentae
- Substance abuse - smoking, alcohol, cocaine
- Vascular disease, e.g. lupus
- Poor nutrition/underweight
- Chronic infections including sexually transmitted infections

***Serial measurement of symphysis-fundal height (SFH)***

A measurement less than the 10th centile for gestational age (as noted on the antenatal SFH graph), or failure of SFH to increase on serial measurements, should raise suspicion of IUGR, and the mother should be referred for ultrasound assessment of the fetus.

**Palpation**

Features that suggest IUGR include

- Palpation of a relatively large hard fetal head with a small body
- Engagement of the head before 37 weeks

**Reduced liquor volume.**

Such findings are an indication for ultrasound to exclude IUGR.

### 9.10.3. Diagnosis

All mothers with IUGR must be referred to hospital for investigations and further management.

Ultrasound scanning, including Doppler flow studies, is used to make a diagnosis.

# CHAPTER X: MULTIPLE PREGNANCY

## 10.1. Definition

Multiple gestation is a term used to describe a pregnancy with more than one fetus. It includes twins, triplets, quadruplets, or more. The most common type of multiple-gestation pregnancy is a twin pregnancy.

## 10.2. Important terms

1. **Zygosity** — Twins can be dizygotic (DZ), resulting from the fertilization of two separate ova during a single ovulatory cycle, or monozygotic (MZ), resulting from a single fertilized ovum that subsequently divides into two separate individuals. Higher order multiples can result from either or both processes.
2. **Chorionicity** — Chorionicity is determined by the number of chorionic (outer) membranes that surround the fetuses in a multiple pregnancy. If there is only one membrane, the pregnancy is described as monochorionic; if there are two, the pregnancy is dichorionic; and if there are three, the pregnancy is trichorionic. Monochorionic twin pregnancies (which are monozygotic) and dichorionic triplet pregnancies carry higher risks because the fetuses share a common placenta, which is associated with an increased risk of discordant growth and twin-twin transfusion.
3. **Amnionicity** — Amnionicity is the number of amnions (inner membranes) that surround fetuses in a multiple pregnancy. Pregnancies with one amnion (so that all fetuses share an amniotic sac) are described as monoamniotic, pregnancies with two amnions are diamniotic, and pregnancies with three amnions are triamniotic. Monoamniotic pregnancies have the greatest risk for fetal and perinatal mortality and morbidity.

## 10.3. Risk factors

- Use of fertility reproduction (in vitro fertilization, ovulation induction)
- Family history
- Previous multiple pregnancy
- Increasing maternal age
- Parity – Increasing parity correlates with an increased likelihood of dizygotic twin birth, even after adjustment for maternal age

## 10.4. Signs and Symptoms

- Fundal height larger the gestational age
- Two audible fetal heart beats
- Multiple fetal parts or more than two fetal poles
- Exaggerated symptoms of Pregnancy

## 10.5. Complications

### 10.5.1. Fetal

- Increased risk of Miscarriage
- Preterm delivery
- Fetal growth restriction
- Congenital anomalies
- Malpresentation
- Polyhydramnios
- Twin-to-twin transfusion (monochorionic twins): Unbalanced blood flow in anastomotic vessels along the equatorial plate of the shared placenta result in TTTS, which is characterized by oligohydramnios (including anhydramnios) in one amniotic sac and polyhydramnios in the other sac.
- Twin anemia-polycythemia sequence (TAPS): a variant of TTTS in which one twin is anemic and the other twin is polycythemic but without amniotic fluid volume discordance
- Single fetal demise

### 10.5.2. Maternal

- Preeclampsia.
- Gestational Diabetes
- Placental Abruption.
- Fetal Demise/Loss.
- Acute fatty liver of pregnancy
- Cesarean delivery

## 10.6. Investigations

- Ultrasound:
  - To estimate gestational age and determine chorionicity and amnionicity
  - The number of placental masses
  - The presence of amniotic membrane(s) and membrane thickness
  - The lambda or T-sign.
- Blood sugar
- FBC

## 10.7. Management

### 10.7.1. Antenatal:

- Routine antenatal care
- Monitor for associated obstetric complications
- Detect anomalies

### 10.7.2. Timing of delivery

The optimum time to deliver uncomplicated twin pregnancies depends on chorionicity and amnionicity:

- Uncomplicated dichorionic/diamniotic twins: 38+0 to 38+6 weeks of gestation
- Uncomplicated monochorionic/diamniotic twins at 36+0 to 36+6 weeks
- Monochorionic/monoamniotic twins: 32+0 to 34+0 weeks

### 10.7.3. Mode of delivery

Women with a multiple pregnancy should have a discussion by 28 weeks with a qualified health care provider about the timing of birth and possible modes of delivery so that a birth plan can be agreed**.** Those women are recommended to give birth at hospitals level because the mode of delivery may be vaginal birth or birth by planned caesarean section because both are safe choices for them and their babies. Look for and anticipate postpartum hemorrhage Non-obstetric complications.

# CHAPTER XI: URINARY TRACT INFECTION IN PREGNANCY

UTI is often referred to as Bacteriuria. It may be Asymptomatic bacteriuria or Symptomatic UTI. Symptomatic UTIs are divided into lower tract (acute cystitis) or upper tract (pyelonephritis) infections. The signs and symptoms, diagnosis and management are as shown below.

### Table 6: Symptoms, diagnosis and management of UTI

| **Parameters** | **Asymptomatic bacteriuria** | **Symptomatic UTI** | |
|---|---|---|---|
| | | **Acute cystitis** | **Pyelonephritis** |
| **Signs and symptoms** | None specifically:<br>• ASB occurs commonly in pregnancy, typically during early pregnancy.<br>• Without treatment, as many as 30%-40% of pregnant women with ASB will develop a symptomatic UTI and progression to pyelonephritis. | • Dysuria,<br>• urgency<br>• frequency,<br>• strangury nocturia,<br>• haematuria<br>• suprapubic discomfort in afebrile women<br>• No evidence of systemic illness.<br>• Pyuria | • Flank or renal angle pain,<br>• pyrexia,<br>• rigor,<br>• chills,<br>• nausea<br>• vomiting.<br>• urea and electrolytes: Elevated creatinine,<br>• Urinalysis- proteinuria<br>• pyuria or leukocyte casts |
| **Management** | • Nitrofurantoin tabs 100 mg 12 hourly for 7 days (Better given in second and third trimester).<br>• Or Amoxycillin 500 mg 8 hourly for 7 days Or Augmentin 625 mg 8 hourly for 7 days | • Amoxicillin (or Amoxiclav) 500 mg PO TID for 7 days<br>• Or Nitrofurantoin 100mg BID for 7 days and Nitrofurantoin.<br>According to level, check urine culture and sensitivities if available. | Management of pyelonephritis should be done at hospital level:<br>Start ceftriaxone 1 g daily IVI; or Ampicillin 1g QID and Gentamycin 1.5 mg 8 hourly then change to oral treatment co-amoxiclav 1 g BID 48 hours after the fever subsides. Treat for 14 days in total. |

**Figure 15: Algorithm of Mother with fever or burning on urination at Health center**

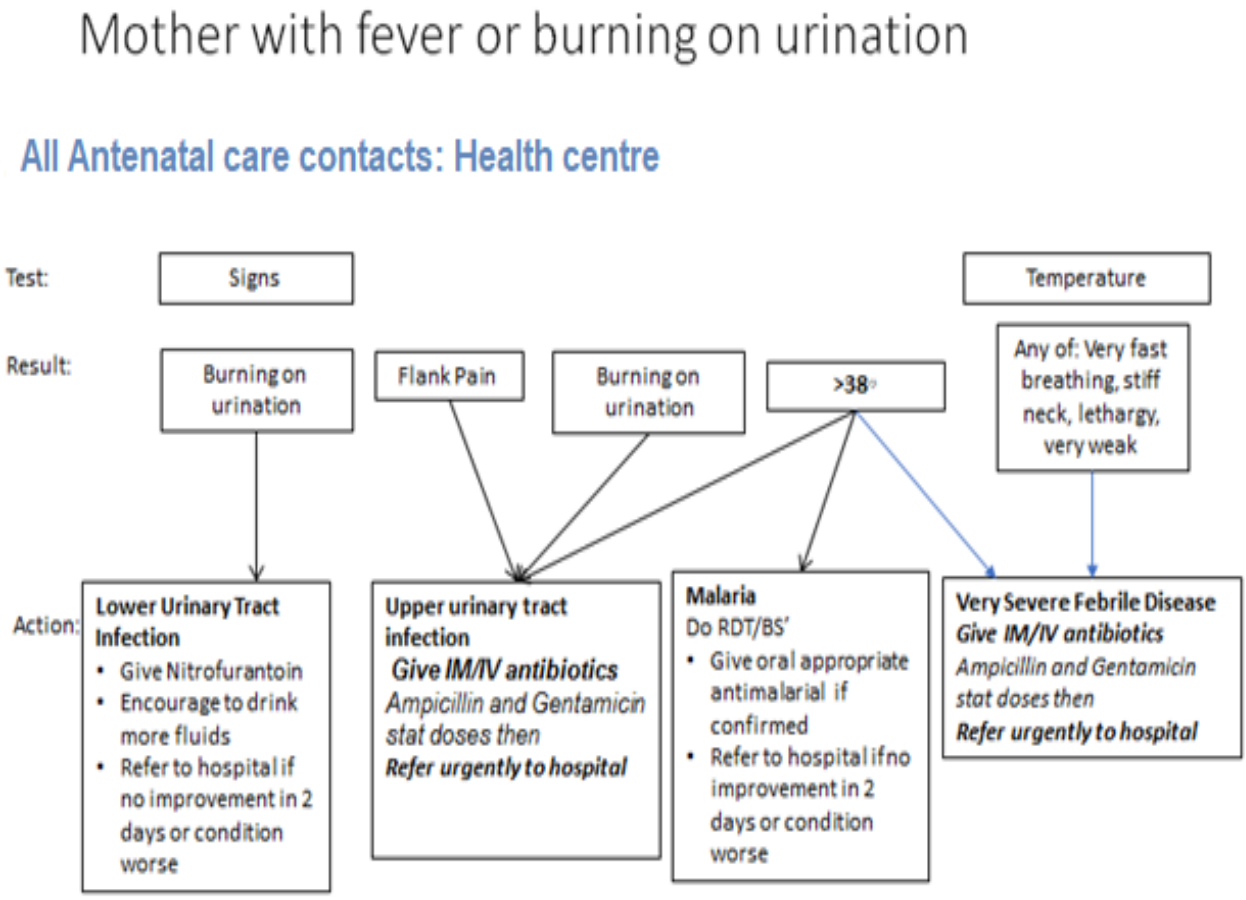
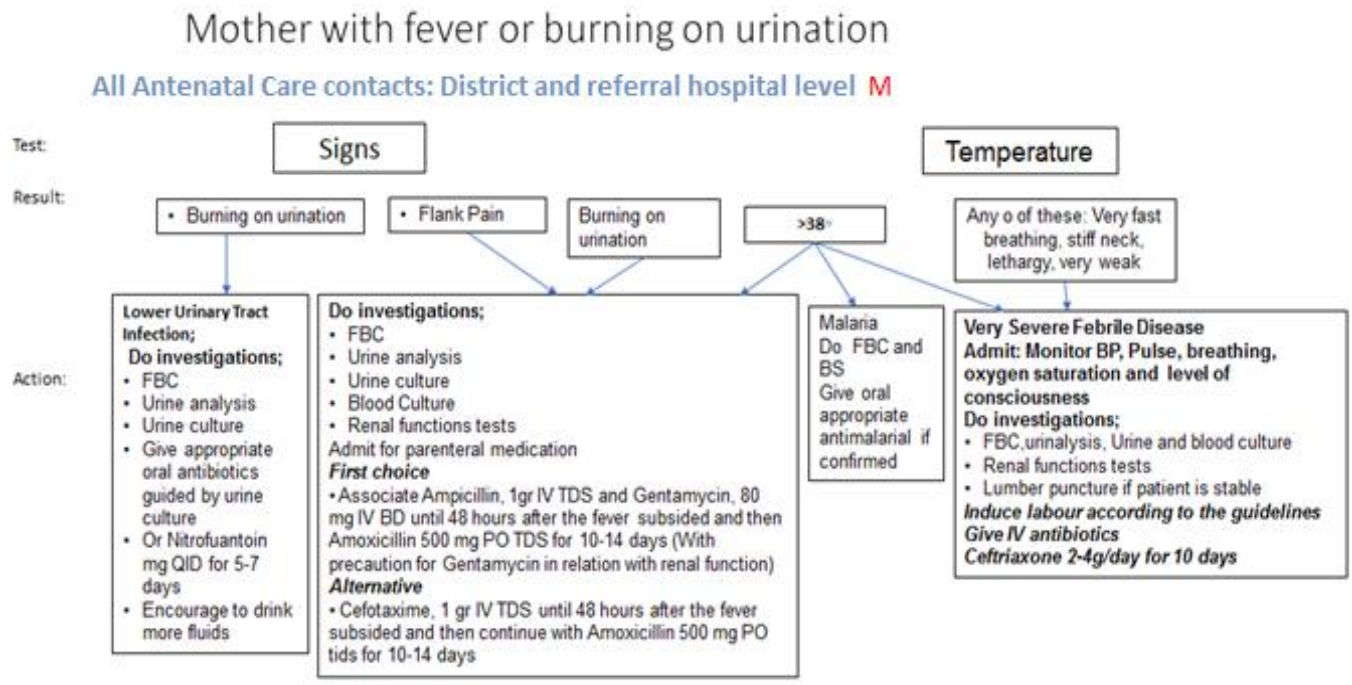


**Figure 16: Algorithm of Mother with fever or burning on urination at district and referral hospital level**




**Key Message: Antenatal education**

Explain that urinary tract infections are common in pregnancy; the risk begins at week 6 and the peak is from 22$^{nd}$ to 24$^{th}$ weeks. If experiencing symptoms (sense of urgency, painful and frequent urination of small volumes - often through straining often with a residual feeling of incomplete emptying), seek medical attention.

# CHAPTER XII: MALARIA AND PREGNANCY

Although Rwanda registered improvement in the fight against malaria, the country has registered increase of malaria cases in the past 3 years. The 2017 maternal death audit highlighted malaria as a leading indirect cause of maternal death at 29%. In addition to increased risk for the mother, malaria can also lead to increased prematurity with poor outcome for the new born.

All women with malaria symptoms will receive early detection and management of malaria[14]. During antenatal care, the health facility staff must do the following to the pregnant woman:

- Give her a long-lasting insecticide treated mosquito net;
- RDTs in case of signs and symptoms.

i. **For simple malaria**, the first line treatment of malaria in pregnancy in the first trimester is quinine sulphate per os 10 mg/kg/dose, 3 times a day for 7 days; AL is indicated during the 2nd and 3rd trimesters of pregnancy.

ii. **For simple malaria with minor digestive symptoms:**

- In the first trimester, administer Quinine dihydrochloride (salt) in intravenous infusion: 10 mg/kg/dose diluted in 10 ml of 5% or 10% glucose, to run for 4 hours in IV perfusion. Then run IV glucose 5 or 10% for 4 hours as maintenance drip for a total of eight hours until patient is able to take drugs orally making sure the treatment does not exceed 24 hours. Once the patient can take orally, complete the remaining quinine 3 X10 mg/kg/day to make 7 days by oral route of drug administration.
- In the second and third trimester, depending on the general status and level of hydration of the patient, drugs may be administered as follows:
  - ✓ **Artesunate** by IV injection: administered as dose of Artesunate 2.4 mg/kg BW IV or IM given then at 12h and 24h; if the patient's condition does not improve within 24 hours of treatment, refer the patient to the nearest district hospital. If the patient's condition improves, change to oral Artemether/lumefantrine twice a day for three consecutive days.
  - ✓ **Quinine dihydrochloride (salt**) intravenous administration: Administered as 10 mg per kg body weight per dose, diluted in 5 to 10 ml of 5% or 10% glucose, every eight hours. If the patient's condition does not improve within 24 hours of treatment, refer patient to the nearest district hospital. If the patient's condition improves, change to

oral Arthemether-Lumefantrine, twice a day for three consecutive days, or to oral quinine in case of contraindications to Arthemether-Lumefantrine.

**iii. Severe malaria**

At the health centre, while organizing an emergency transfer, administer loading dose by intravenous infusion of quinine 20 mg/kg body weight in 10 ml of 5% or 10 % dextrose to run for 4 hours (without exceeding 1200 mg); before transferring the patient, administer Artesunate 2.4 mg/kg BW IV or IM. If there is a contra indication to Artemisinin derivates and depending on the general condition of the patient, use Quinine (refer to the National malaria treatment guidelines for guidelines details and management at the hospital level).

# CHAPTER XIII: INFECTIONS IN PREGNANCY

## 13.1. Abnormal vaginal discharge

### 13.1.1. Introduction

Vaginal discharge should be considered abnormal if it is itchy, excessive, yellow or green, or offensive smelling. Wherever possible, use a vaginal speculum to observe the discharge and inspect the cervix.

### 13.1.2. Causes of vaginal discharge

- Bacterial vaginosis. Bacterial vaginosis is a quite common bacterial infection. ...
- Trichomoniasis. Trichomoniasis is another type of infection. ...
- Vaginal Candidiasis
- Gonorrhea and chlamydia. ...

## 13.2. Vaginal Candidiasis

### 13.2.1. Symptoms/Signs include:

- Itching and irritation in the vagina and vulva
- A burning sensation, especially during intercourse or while urinating
- Redness and swelling of the vulva
- Vaginal pain and soreness
- Vaginal rash
- Thick, white, odour-free vaginal discharge with a cottage cheese appearance
- Watery vaginal discharge
- Thick, white vaginal discharge with itch.

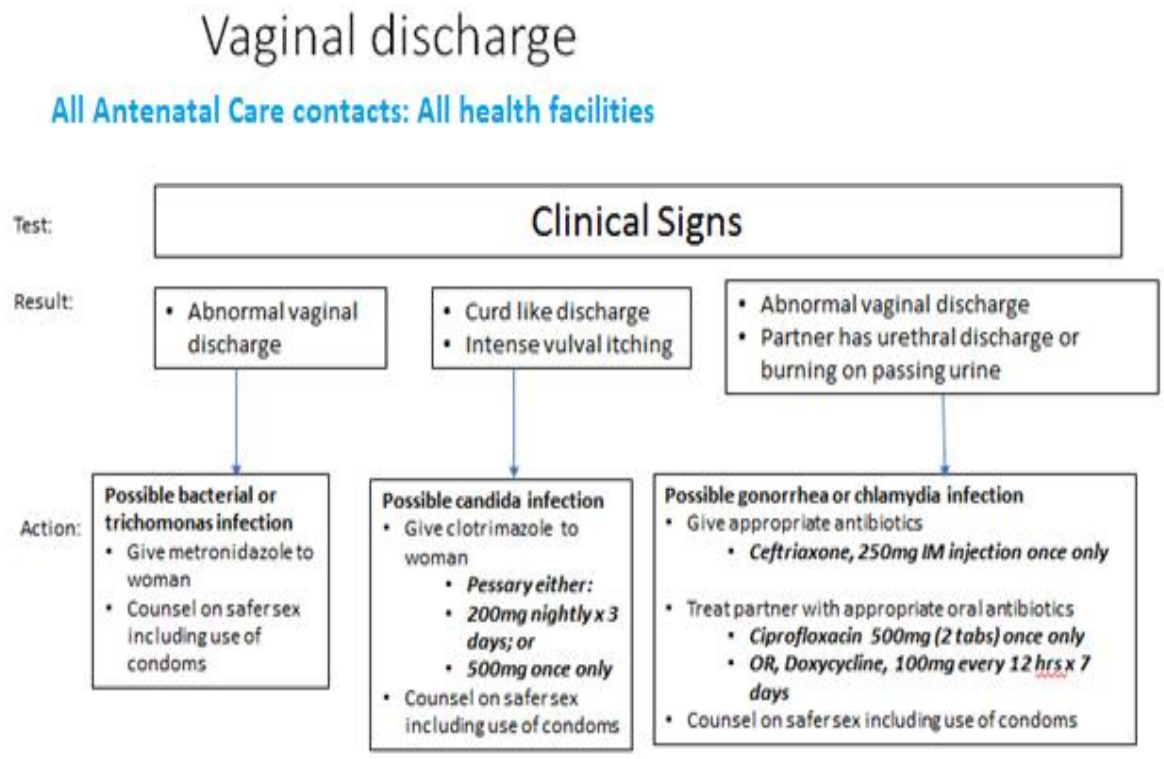
### 13.2.2. Investigation:

- Microscopy: hyphae or pseudo hyphae.
- Urinalysis
- PH: Normal which is different from bacterial vaginosis and Trichomoniasis

### 13.2.3. Treatment:

- Give a Clotrimazole 200 mg pessary to insert into vagina that evening (single dose)
- If vulval burning/itching give a Clotrimazole cream to vulva twice daily for 7 days
- Fluconazole Tabs 150 mg single dose for uncomplicated,
- Complicated > 3 episodes per year: Fluconazole 150 mg every 72 hours 3 doses and topical azoles for 7 to 14 days.

**Figure 17: Algorithm Vaginal discharge**




## 13.3. Gonorrhea, Chlamydia and Trichomonas

### 13.3.1. Symptoms

- Both chlamydia and gonorrhea show the same symptoms of:
  - Abnormal vaginal discharge
  - Bleeding between periods
  - Pain during period, when urinating and while having sex
  - Itching and burning around the area of the vagina

### 13.3.2. Treatment:

- Treat syndromic ally for gonorrhea, chlamydia and trichomonas, with triple antibiotics: Ceftriaxone 500mg IM as a single dose, Azithromycin 1 g orally as a single dose and Metronidazole 2 g stat
- Severe penicillin allergy (Angioedema, anaphylactic shock, bronchospasm and Steven-Johnsons syndrome), replace Ceftriaxone with high dose azithromycin 2 g orally as a single dose.

## 13.4. Bacterial vaginosis

### 13.4.1. Introduction

- Bacterial vaginosis mostly asymptomatic is secondary to overgrowth of bacteria naturally found in the vagina, which upsets the natural balance.
- Women in their reproductive years are most likely to get bacterial vaginosis, but it can affect women of any age. The cause isn't completely understood, but certain activities, such as **unprotected sex or frequent douching, increase the risk.**

### 13.4.2. Symptoms

- ✓ Bacterial vaginosis signs and symptoms may include:
- ✓ Thin, gray, white or green vaginal discharge
- ✓ Foul-smelling "fishy" vaginal odour

### 13.4.3. Complications

- ✓ Preterm birth.
- ✓ High risk of transmitting STIs
- ✓ Infection risk after gynecologic surgery.
- ✓ Pelvic inflammatory disease (PID).

### 13.4.4. Investigations

- ✓ Vaginal swab/clue cells on microscopy
- ✓ Urinalysis

### 13.4.5. Treatment

- ✓ Metronidazole Vaginal pessaries 500mg 8h for 5 days
- ✓ OR Metronidazole tabs 500 mg 12 hourly for 7 days
- ✓ Alternatively, Clindamycin 300 mg BD for 7 days

### 13.4.6. Prevention

To help prevent bacterial vaginosis:

- ✓ Minimize vaginal irritation. Use mild, non-deodorant soaps and unscented tampons or pads.
- ✓ Don't douche; used normal bathing.
- ✓ Avoid all sexually transmitted infection. **.**

**Note: It is not necessary to treat sexual partners**

## 13.5. Genital warts

### 13.5.1. Introduction

These are caused by the human papilloma virus (HPV) and are sexually transmitted. They can be external on the vulva or perineum, or internal in the vagina or on the cervix.

### 13.5.2. Symptoms

- Vaginal Discharge
- Itching
- Bleeding
- Burning Sensation

### 13.5.3. Treatment

**Podophyllin is contraindicated in pregnancy.**

- If small (<10 mm), soft and involve the skin, no treatment is indicated in pregnancy and can be treated postpartum.
- If very large, bleeding or infected, refer to referral hospital for excision or cauterization.
- Consider elective caesarean section if warts are very large and may obstruct vaginal

delivery.

- Do a Pap smear (if not done within the past year); this can be done up to 30 weeks' gestation.

## 13.6. Syphilis

### 13.6.1. Introduction

Syphilis is a sexually transmitted illness (STI) caused by spirochete Treponema pallidum that can be transmitted from mother to fetus. Majority of infants born to mothers with active syphilis will become infected in utero leading to miscarriages, stillbirth, neonatal death, neonatal disease or latent infection.

### 13.6.2. Clinical manifestations according to the stage of syphilis

**Table 7: Clinical manifestations**

| **Stage** | **Clinical manifestation** |
|---|---|
| Primary syphilis | Single painless ulcer (chancre) at site of inoculation, regional adenopathy |
| Secondary syphilis | Rash (disseminated and/or involving the palms and soles), fever, malaise, mucocutaneous lesions, hepatitis, arthritis, glomerulonephritis, condyloma lata, pharyngitis, alopecia |
| Latent:<br>Early latent (<1 year after initial infection<br>Late latent (>1 year after initial infection) | All are asymptomatic |
| Tertiary (late) syphilis | |
| Gummatous disease | Granulomatous disease of the skin and subcutaneous tissues, bones, or viscera |
| Cardiovascular | Aortic aneurysm, aortic insufficiency |
| Central nervous system disease (neurosyphilis) | Tabes dorsalis, Argyll-Robertson pupils, paresis, seizures, subtle psychiatric manifestations, dementia. May be asymptomatic |
| **Neurosyphilis (can occur at any time during the course of infection)** | |
| **Early signs**<br>Asymptomatic meningitis, symptomatic meningitis, or, less commonly, meningovascular disease (i.e., meningitis and stroke). Vision or hearing loss with or without concomitant meningitis may also be present, and ocular and otologic syphilis is treated as neurosyphilis<br>**Late signs include:**<br>Most common forms involve the brain and spinal cord (dementia, general paresis and tabes dorsalis). | |

All pregnant women should be screened for syphilis at their first contact with medical personnel using VDRL or RPR. If reactive, Treponema test is advised for definitive diagnosis (TPHA).

### 13.6.3. Syphilis screening in pregnancy

- ✓ Rapid syphilis screening must be done at the first antenatal contact.
- ✓ If the first test is performed before 20 weeks and is negative, a second test should be done at 32-34 weeks.
- ✓ A rapid card test, done in the antenatal clinic, gives a result before the woman goes home. This allows immediate treatment.
- ✓ Treat all women with a positive screening test, irrespective of titre.

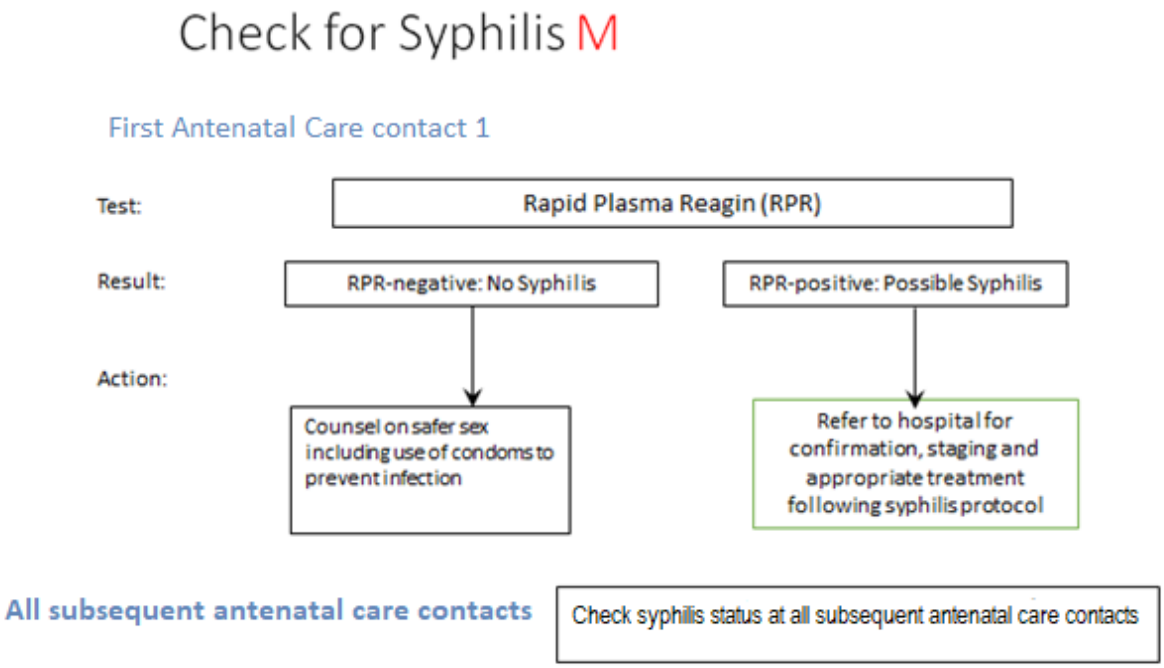
### 13.6.4. Management

- ✓ Benzathine Penicillin G 2.4 MU IM once for primary and secondary syphilis, then 2.4 MU weekly for latent and tertiary syphilis give 3 doses. If allergic to penicillin, then
    - o Erythromycin 500 mg PO QID x 14 days or Azithromycin 2 g once orally or Ceftriaxone 1 g IM once daily for 10 days.
- ✓ Partner notification and treatment.
- ✓ Fetal US to identify severely infected fetus (enlarged placenta, IUGR, microcephaly, hepatosplenomegaly and hydrops).
- ✓ Alert pediatrician so that they can evaluate the neonate for congenital syphilis

**Note:**

**Although erythromycin and azithromycin treat the pregnant women they do not cross the placental barrier completely and as a result the fetus is not treated. It is therefore necessary to treat the newborn infant soon after delivery. Syphilis during pregnancy can lead to severe adverse complications to the fetus or newborn**

**Figure 18: Algorithm for syphilis screening**




## 13.7. Hepatitis B

A pregnant woman who is tested positive for Hepatitis B must be referred to the hospital for further management.

Hep B vaccine is provided to newborn immediately after birth.

## 13.8. HIV

According to WHO 2015 Consolidated guidelines on HIV testing services, Provider Initiated Testing and Counseling (PITC) denotes an HIV testing service that is routinely offered in a health-care facility and includes providing pre-test information and obtaining consent, with the option for individuals to decline testing. PITC has proved highly acceptable and has increased the uptake of HIV testing in LMICs.

The availability of HIV testing at ANC services is responsible for the high level of knowledge of HIV status among women in many countries, which has allowed women and infants to benefit from ART.

WHO recommends that ART should be initiated in all pregnant women diagnosed with HIV at any CD4 count and continued lifelong? This recommendation is based on evidence showing that

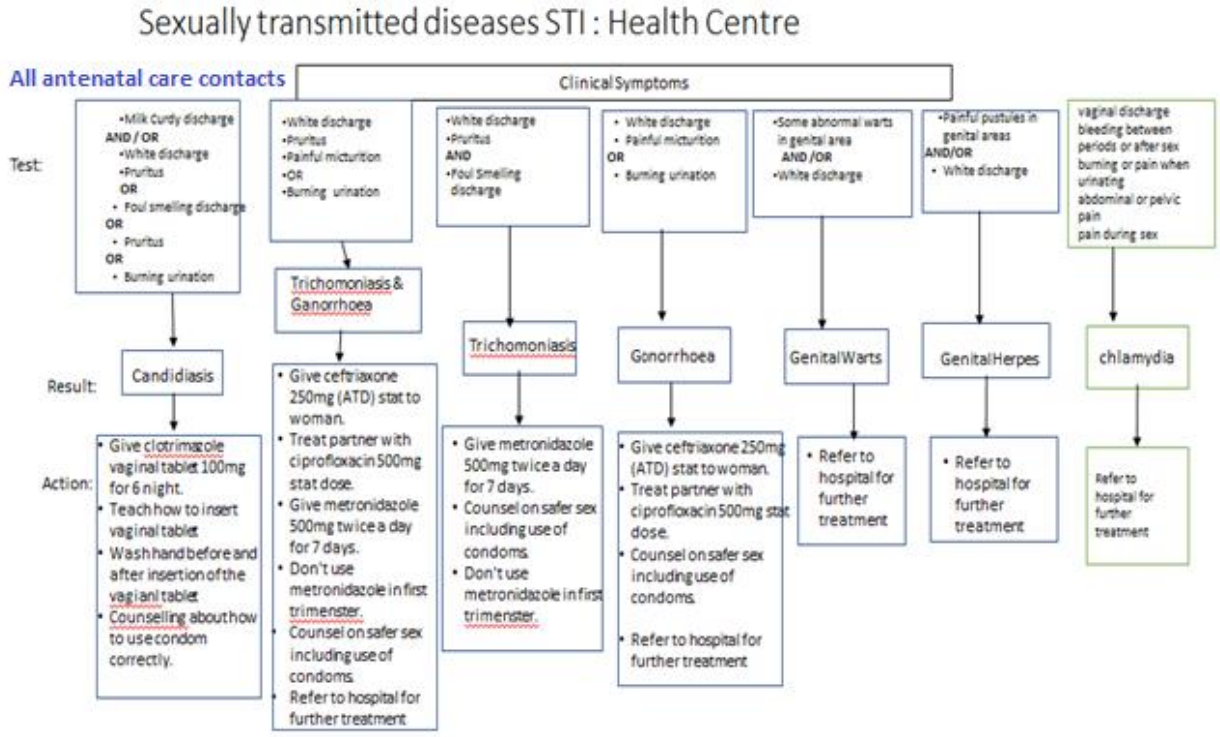
providing ART to all pregnant and breastfeeding women living with HIV improves individual health outcomes, prevents mother-to-child transmission of HIV, and prevents horizontal transmission of HIV from the mother to an uninfected sexual partner.

Rwanda adopted the WHO recommendation on PITC; this is reflected in the Rwanda HIV and AIDs National Strategic Plan (NSP) 2013 -2018.
In the NSP, elimination of Mother-to-child transmission of HIV (EMTCT) is among the prioritized areas.

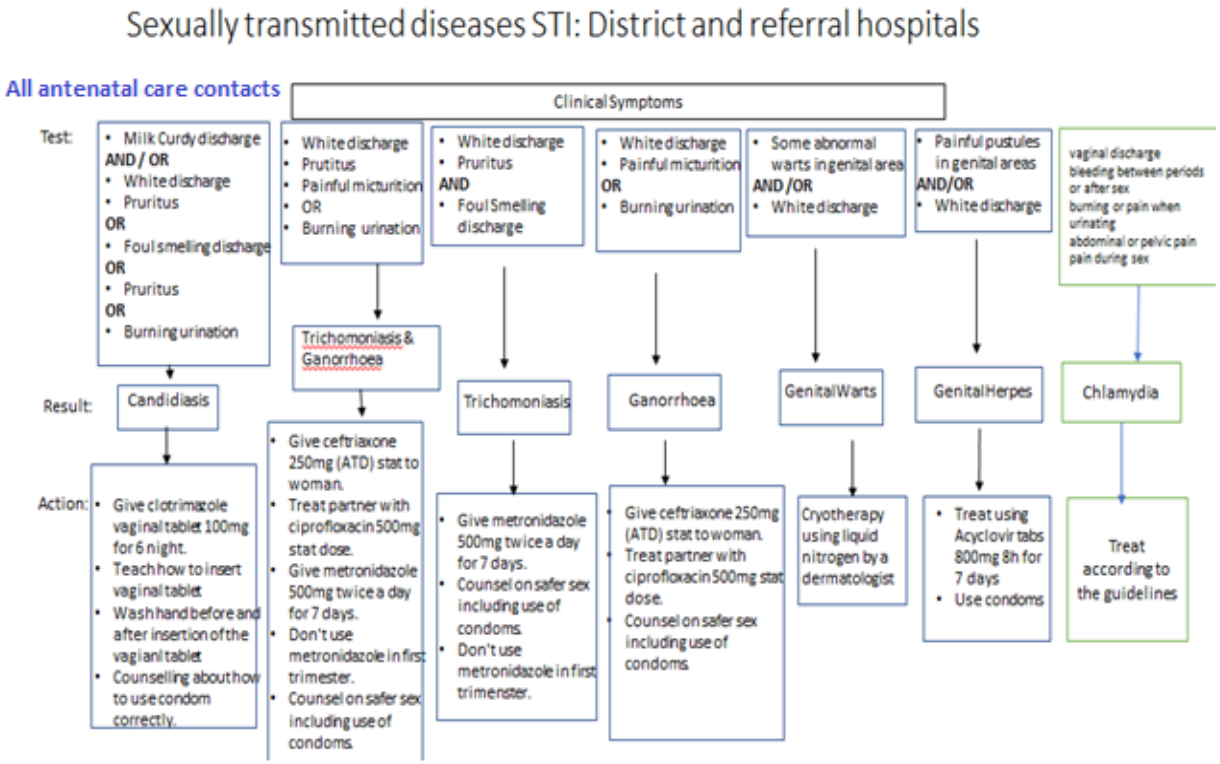
The overall goal of the national EMTCT initiative is to eliminate new pediatric HIV infections and improve maternal, newborn and child health and survival in the context of HIV. PITC was already being applied in Rwanda where 97% of health facilities are covered with counseling and testing for HIV[22].

The HIV management refers to current HIV national guidelines 2016.

## Figure 19: Algorithm for STI at health center level




## Figure 20: Algorithm of STI management at district and referral levels



# CHAPTER XIV: COMMUNITY BASED ANC SERVICE PROVISION

## 14.1. Community awareness and engagement for ANC

Communication and support should be considered as integral components of positive pregnancy experience. The care group model should be used to motivate pregnant women to use as required ANC services.

The care group approach is designed to reach a large population while maintaining cost-efficiency, sustainability and intensive support to volunteers and beneficiaries. About 10-15 community health workers in charge of maternal health (also called ASM "Agents de santé Maternelle) will comprise each group, which meets once a month. Then, pregnant women and their husbands/partners should meet with the ASM once a quarter.

One staff promoter (**this promoter could be the community health worker supervisor at the health center level)** will train and supervise as many as eight care groups of 10-15 volunteers each.

Trained health center staff will use participatory methods for behavior change promotion, including demonstrations, role plays, stories and songs (often composed by the Care group volunteers themselves) to convey these messages.

Participatory women's groups represent an opportunity for women to discuss their needs during pregnancy, including barriers to reaching care, and to increase support to pregnant women.

The Maternal Community Health Worker, also called ASM (agents de santé maternelle) and her specific activities are related to maternal and newborn health, targeting women and their newborn from pregnancy until the newborn reaches the age of 2 months.

ASM specific activities are related to maternal and newborn health, targeting women and their newborn from pregnancy until the newborn reaches the age of 2 months.

## 14.2. Roles and Responsibilities of ASM

- ✓ Identification of girls and women in reproductive age and their recording in a register;
- ✓ Do UPT if the ASM suspects that the girl or woman is pregnant and refer her immediately to HF for first contact if UPT is positive;

- ✓ Identification of pregnant women living in the Maternal Community Health Worker's Village in order to plan both antenatal and postnatal home visits;
- ✓ Reporting pregnant women via RapidSMS as a way of a thorough follow up on maternal and child health care.
- ✓ Conducting three home-based antenatal care contacts to pregnant women living in the same village as the Maternal Community Health worker.

**The First home-based antenatal care contact** — to be conducted as soon as the pregnancy has been identified. The following activities will be done by the ASM:

- ✓ Sensitizing all pregnant women to conduct antenatal checkups at a local health center as a preventive strategy for both themselves and their pregnancies. The following are the services they receive: get tested for high blood pressure, take folic acid tablets, get vaccinated against tetanus, and sleep in treated mosquito bed nets to protect them from malaria. Get tested for HIV/AIDS and, if positive, receive counseling on PMTCT (Prevention of Mother-To-Child Transmission).
- ✓ Identification of danger signs and provision of appropriate care. If a woman shows any danger signs, the Maternal Community Health Worker will file the case and refer the woman to health facility.
- ✓ During education session: using counseling cards card showing the kind of care needed by a pregnant woman: hygiene, enough rest, balanced diet, and sleeping in a treated mosquito bed net.
- ✓ Checking if the woman has a medical insurance, and if not, advising her to seek one.
- ✓ Reporting through RAPID SMS while reporting on the conducted maternal visits and to always send out emergency message and send out a red alert, if need be.

**The Second home-based antenatal care contact** is conducted when the pregnancy is between five and six months old.

- ✓ Recap of the previous visit
- ✓ Checking any danger signs and transfer the woman to hospital or health center if need be.
- ✓ Should the Maternal Community Health Worker detect any danger signs, she will record it in a register and transfer the pregnant woman to health center for medical attention.
- ✓ Assisting the pregnant woman on the delivery preparedness and making birth plans with her.

- ✓ Advising any pregnant woman to go to health facility for delivery. HIV-AIDS positive women are advised to seek medical care to prevent mother-to-child transmission.
- ✓ Provide information about postpartum hemorrhage prevention and advice on hemorrhage preventive measures (see cards 6-9).
- ✓ Reporting on visit activities conducted and other red alerts messages via the RapidSMS where necessary.

**The third antenatal home contac**ts conducted when the pregnancy is 8-9 months old.

- ✓ Recap of the second visit discussions;
- ✓ Discussing on family planning methods the mother will use when she is back in her fertility period;
- ✓ Giving an educative session on breastfeeding, postnatal care visit and low birth weight baby in home-based care;
- ✓ Giving information about postpartum hemorrhage prevention and advising on preventive hemorrhage measures;
- ✓ Reporting on visit activities conducted and other red alert messages through RapidSMS where necessary.

## 14.3. Key messages

- ✓ Birth preparedness and complication readiness plans: identify place for delivery, save money (including an emergency fund), prepare essential items for clean and safe delivery and arrange transport, blood donor.
- ✓ Healthy eating (milk, sweet potatoes, vegetables/legumes, fruits), fishes (indagara), eggs;
- ✓ Physical activity, tobacco and substance use, limiting caffeine;
- ✓ Healthy timing and spacing of pregnancies;
- ✓ Use of LLINs
- ✓ Danger signs and what to do if they occur (emergency transportation).

## 14.4. Community engagement platforms

In addition to the formal wide network of community health workers, other actors should play an important to promote ANC at the village level involved in the

- ✓ Umugoroba w'ababyeyi (the village roundtable program): this forum could be a good platform to discuss and sensitize women and adolescent girls to effectively use ANC services; and also, an opportunity to discuss on male involvement.
- ✓ National Women's Council Village Committees: their monthly gatherings could be opportunities to mobilize pregnant women for ANC;
- ✓ Schools: distribution of IEC materials to school children and incorporation of key concepts of ANC for a positive pregnancy experience in children second school curriculum;
- ✓ Local leaders, especially chief of villages should give promotion messages about ANC during monthly Umuganda activities;
- ✓ Youth and sport clubs are also an appropriate platform to discuss issues and suggest solutions for a positive pregnancy experience;
- ✓ Media (TV; Radio, Print media).

# CHAPTER XV: MONITORING AND EVALUATION OF ANC

Monitoring refers to the regular tracking of ANC Program activities, by measuring on a regular basis whether planned activities are being carried out at the right level and how well program activities are being performed. In addition to routine data collection, surveys, focus groups or other qualitative methods can be carried out.

Evaluation of outcomes and impact is needed to document periodically whether defined strategies and implemented activities are leading to expected results.

## 15.1. Data management

It is crucial to ensure that ANC data meet the characteristics of data quality: accuracy, accessibility, validity, reliability, timeliness, relevance and completeness; in addition to that, data should be readily available to stakeholders.

Standard forms are to be used and staff must be trained in data recording. All service providers must fully comply with collection of data on each of the 8 ANC contacts and report through DHIS-2 and SIS-com. Care provided must be recorded on a clinical record and home-based record and this should include results from clinical findings, treatments, reasons for referral (if necessary) and follow-up recommendations.

Data confidentiality should be prioritized when data are collected, transmitted, and stored. Confidential information should not be recorded on the home-based record. It is also important to maintain all clinical records and other documentation and file them properly. In addition to that, supervisors at all levels should ensure the completeness of record entries.

## 15.2. Monitoring of ANC programme

Every health facility providing ANC services should be involved in monitoring and evaluation of the ANC program. The aim of monitoring and evaluation is to ensure that the health providers remain focused on the goals, objectives and set targets.

The day-to-day monitoring of performance and quality should be a supervisor's main concern. The use of data for early and appropriate action is needed to improve ANC coverage and quality.

### Table 8: List of Key core and context-specific indicators for monitoring routine ANC

| Indicator Name | Numerator | Denominator | Preferred Data Source | Other Data Source(s) |
|---|---|---|---|---|
| Percentage of pregnant women with at least three antenatal care contacts | Number of Antenatal clients with at least three antenatal care contact | Total number of expected pregnancies | | HMIS |
| Percentage of pregnant women with first antenatal care contact in the first trimester (before 12 weeks of gestation) | Number of pregnant women aged 15-49 who had their first antenatal contact in the first trimester | Total number of women aged 15-49 years with at least one antenatal care contact | Population-based surveys | |
| | Number of antenatal clients 1st contact before 12 weeks | Total number of expected pregnancies | | HMIS |
| Percentage of pregnant women who received iron and folic acid supplements for 90+ days | Number of pregnant women who received the recommended number of iron/folic acid tablets during last pregnancy | Total number of women with a live birth | Population-based surveys | |
| | Number of antenatal clients who received iron/folic acid supplements for 90+ days at 1st contact | **Total number of antenatal clients with at least one contact** | | HMIS |
| Percentage of pregnant women screened for syphilis during antenatal care | Number of antenatal clients screened for syphilis at 1st ANC contact | Total number of antenatal clients with at least one ANC contact | HMIS | |
| Percentage of pregnant women screened for anaemia during antenatal care | Number of antenatal clients screened for anaemia at 1st ANC contact | Total number of antenatal clients with at least one ANC contact | HMIS | |

| Indicator Name | Numerator | Denominator | Preferred Data Source | Other Data Source(s) |
|---|---|---|---|---|
| Percentage of pregnant with anaemia during antenatal care | Number of antenatal clients with anaemia at 1st ANC contact | Total number of antenatal clients with at least one ANC contact | HMIS | |
| Percentage of pregnant women tested for HIV during antenatal care | Number of antenatal clients tested for HIV at 1st ANC contact | Total number of antenatal clients with at least one ANC contact | HMIS | |
| Percentage of pregnant women tested HIV+ during antenatal care | Number of antenatal clients tested HIV+ at 1st ANC contact | Total number of antenatal clients tested for HIV at 1st ANC contact | HMIS | |
| Antenatal care contacts<br>A. Percentage of pregnant women with at least four antenatal care contacts<br>B. Percentage of pregnant women with at least eight antenatal care contacts | Number of women aged 15−49 years with a live birth who received antenatal care from any provider:<br>A. four or more times<br>B. eight or more times | Total number of women aged 15−49 years with a live birth | Population-based surveys | |
| | Number of pregnant women who received antenatal care from any provider:<br>C. four standard contacts<br>D. Eight standard contacts | Total number of expected pregnancies | HMIS | |
| Percentage of pregnant women who were told | Number of women aged 15-49 years with a live birth told | Total number of women aged 15-49 years with at least one ANC contact | Population-based surveys | |

| Indicator Name | Numerator | Denominator | Preferred Data Source | Other Data Source(s) |
|---|---|---|---|---|
| about pregnancy danger signs during antenatal care | about pregnancy danger signs during antenatal care | | | |
| Percentage of pregnant women with an ultrasound scan before 24 weeks* | Antenatal clients who received ultrasound scan before 24 weeks | Total number of antenatal clients with At least 1st contact | HMIS | |
| Percentage of pregnant women with an ultrasound scan before 24 weeks* | Antenatal clients who received ultrasound scan before 24 weeks | Total number of expected pregnancies | HMIS | |

**N.B**

Some of the above indicators are output indicators and they will be monitored systematically on a monthly basis and a decision should be taken to improve ANC services. However, we should keep in mind that other ANC indicators, especially those impact indicators collected through Demographic and Health Surveys (DHS) remain important for evaluation of ANC implementation.

## 15.3. Research

In the context of making pregnancy a positive experience, research including operational research is needed to find solutions for increasing antenatal care contacts and to significantly reduce maternal and neonatal morbidity and mortality.

Some areas of research may include an evaluation of the impact of the community care group model as a strategy to improve maternal and neonatal health.

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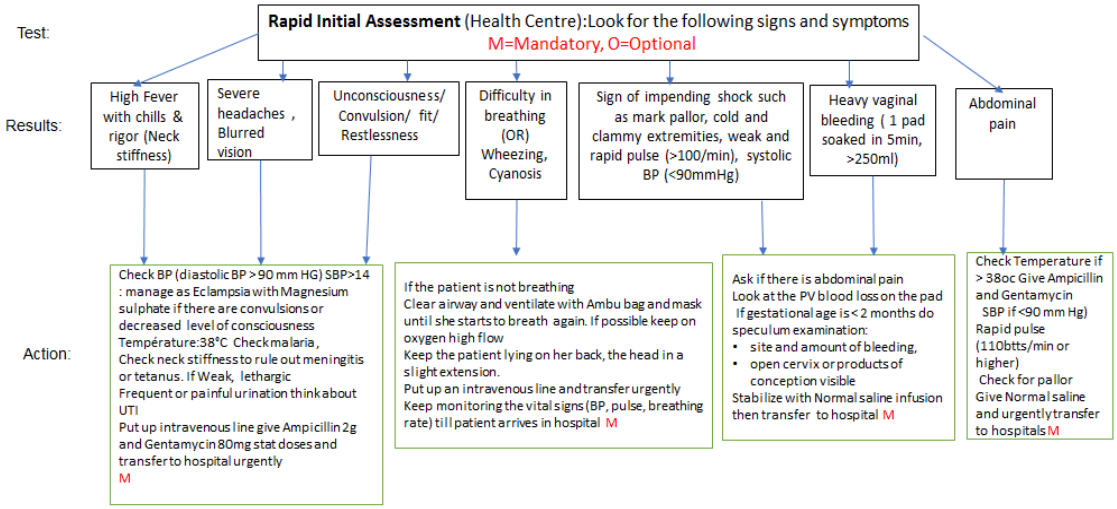
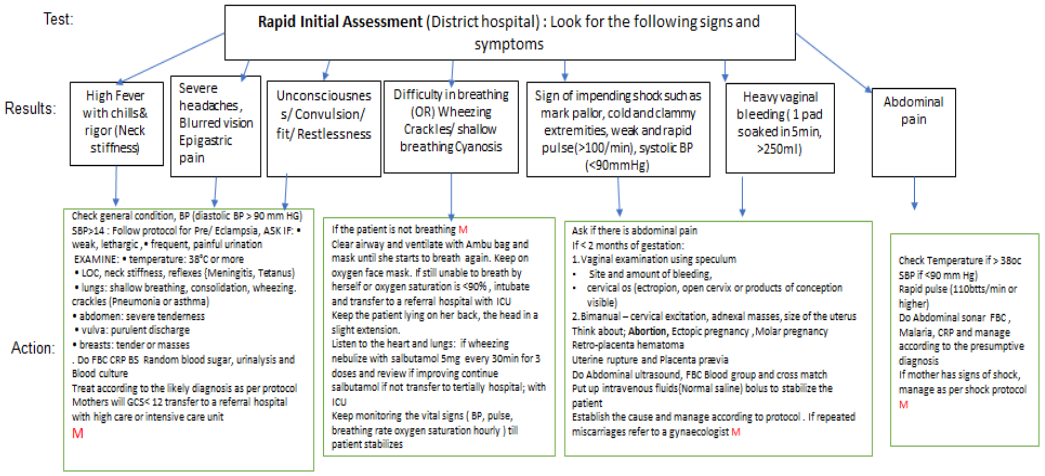
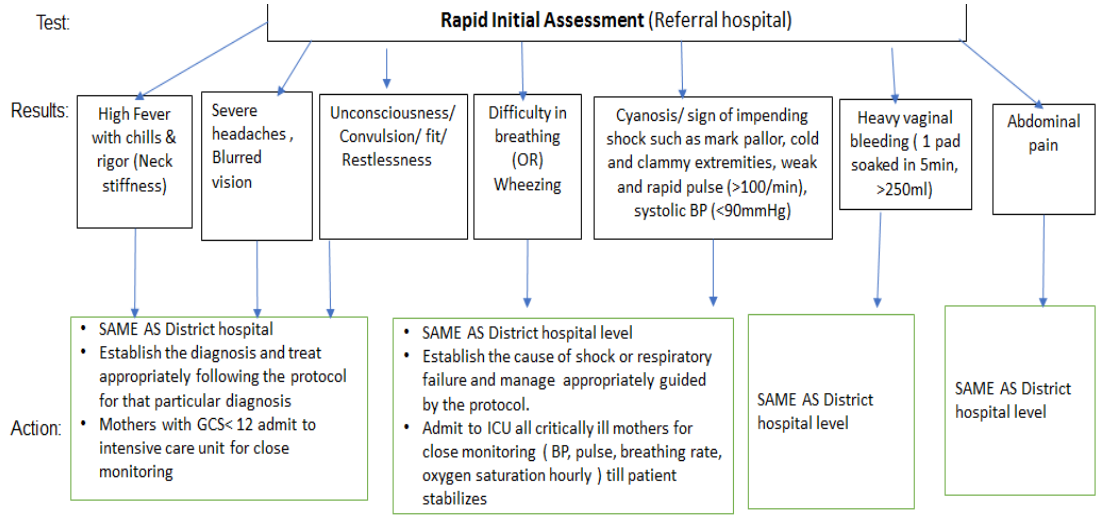
# ANNEXES

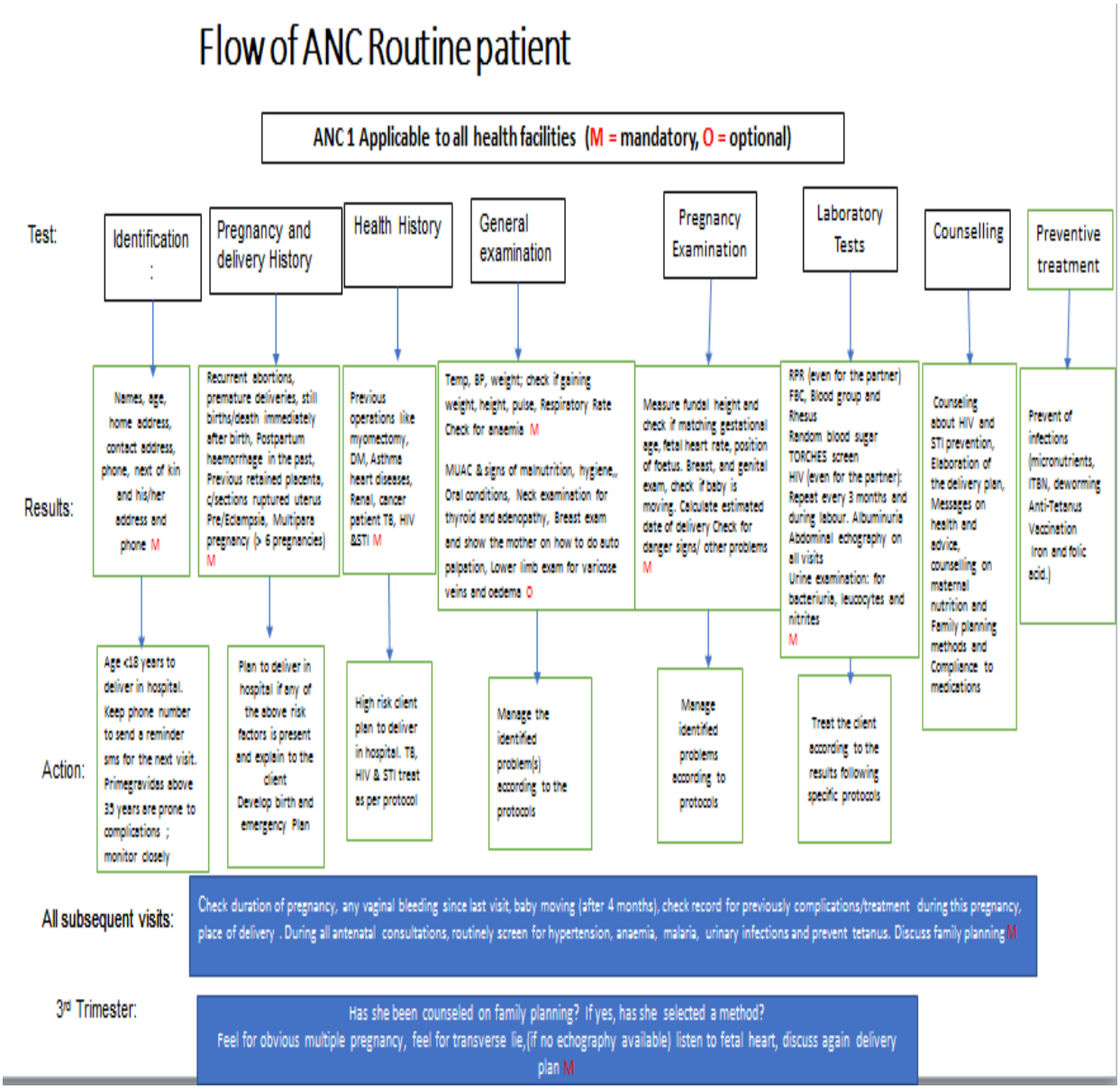
## Annex 1: Rapid initial Assessment algorithm



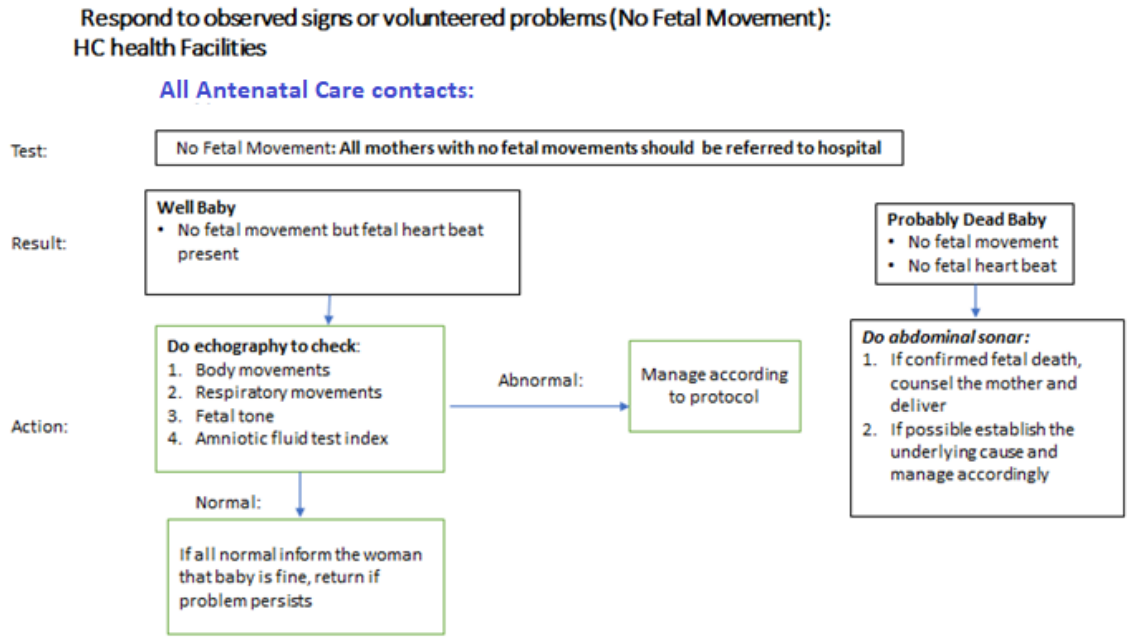



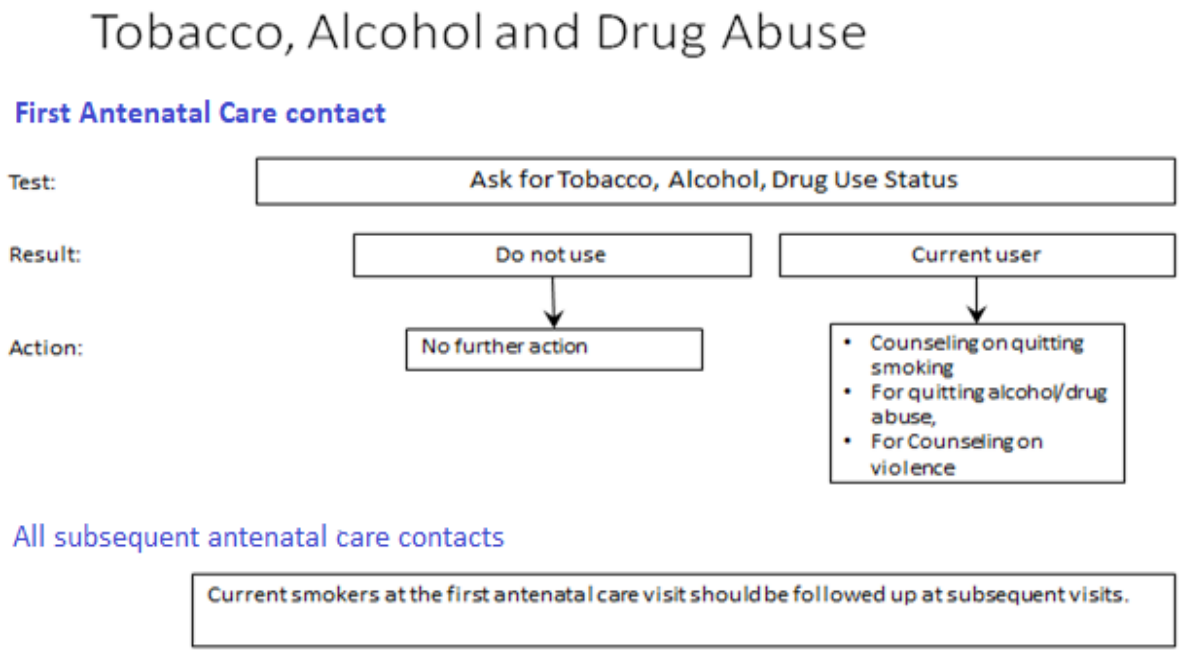
## Annex 2: ANC flow for routine patient



## Annex 3: Algorithm for check of fetal movement and response




## Annex 4: check of use of drug Abuse, Tobacco and Alcohol



## Annex 5: Five keys to safer food