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MINISTRY OF HEALTH - ETHIOPIA
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National Antenatal Care Guideline

Ensuring Positive Pregnancy Experience!

February 2022

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List of Boxes and Tables

Acronyms

ANC	Antenatal care
BEmONC	Basic emergency obstetric and newborn care
BMI	Body mass index
CEmONC	Comprehensive emergency obstetric and newborn care
CQI	Continuous quality improvement
EDD	Estimated due date/expected date of delivery
EmONC	Emergency obstetric and newborn care
eMTCT	Elimination of mother-to-child transmission
FANC	Focused antenatal care
FGM	Female genital mutilation
Hb	Hemoglobin
HBV	Hepatitis B virus
Hct	Hematocrit
HDP	Hypertensive diseases in pregnancy
HEP	Health extension program
HEW	Health extension worker
HMIS	Health management information system
IDP	Internally displaced persons
IFA	Iron-folate acid
IPTp	Intermittent preventive treatment in pregnancy
LEEP	Loop electrosurgical excision procedure
LNMP	Last normal menstrual period
MCH	Maternal and child health
MCV	Mean corpuscular volume
M&E	Monitoring and evaluation
MoH	Ministry of Health
MUAC	Mid-upper arm circumference
OGTT	Oral glucose tolerance test
PMTCT	prevention of mother-to-child transmission
PrEP	Pre-exposure prophylaxis
RBC	Red blood cell
RH	Reproductive health
STI	Sexually transmitted infection
TDF	Tenofovir disoproxil fumarate
TT	Tetanus toxoid
Td	Tetanus–diphtheria
Tb	Tuberculosis
UTI	Urinary tract infection
WHO	World Health Organization
3TC	Lamivudine
-ve	Negative
+ve	Positive

Foreword

In 2016, the World Health Organization (WHO) released its antenatal care recommendations for a positive pregnancy experience, which includes 49 recommendations (19 recommended, 23 context-specific recommended, and 7 not recommended for routine practice) to improve maternal and fetal health and make the index pregnancy a positive experience. Focused antenatal care (FANC) has been taken as a standard of care for more than a decade. The transition from the well-accustomed practice of FANC to the new ANC model will be materialized through quality improvement, health system strengthening, and capacity building.

The guidance in this document is aligned with the WHO recommendations. The recommendations have been prioritized, contextualized, and enriched by related evidence from up-to-date systematic reviews and meta-analyses, and have been thoroughly reviewed by the national technical working group.

This guideline is intended to be used from the policy to facility level in the health system as an important resource for the country's endeavors to achieve the goal of ending preventable maternal and perinatal deaths by 2030 (the Sustainable Development Goal target) and moving faster towards universal health coverage. It also serves as an important and reliable resource for health care providers and programmers by providing up-to-date evidence and workable recommendations.

At the Ministry of Health level, the MCH Directorate, as a lead implementer, will advocate and coordinate its full implementation. Other concerned directorates in the Ministry, agencies accountable to the Ministry, regional health bureaus, implementing partners, and other stakeholders in the health sector will have a significant role in the implementation of this guideline.

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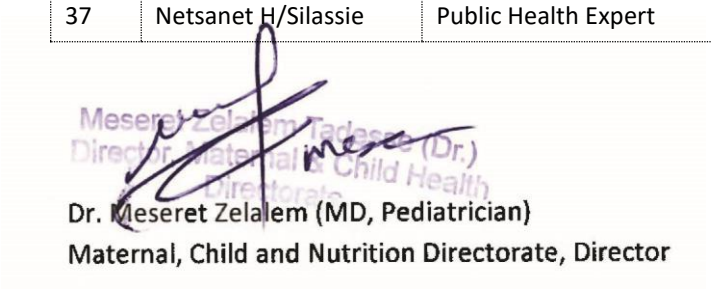

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Executive Summary

Within the continuum of reproductive health care, antenatal care (ANC) provides a platform for important health care functions, including health promotion and disease prevention, and screening, diagnosis, and management. By implementing timely and appropriate evidence-based practices, ANC can improve maternal and perinatal outcomes and provide an opportunity to communicate with and support pregnant women and their families.

In 2016, the World Health Organization (WHO) released comprehensive recommendations on ANC for a positive pregnancy experience. This new model for delivering ANC is a goal-oriented approach to delivering evidence-based interventions focusing on the quality and content of care
The objective of this document is, therefore, to provide evidence-based guidance for policy makers, health programmers and health workers on comprehensive, integrated, and effective ANC service modality and thereby improve maternal and fetal-neonatal health. In line with the WHO recommendation, they will facilitate a positive pregnancy experience by providing quality, integrated, comprehensive, and women-centered care.

The guideline has both clinical and public health outcomes of interest. This guideline replaces focused antenatal care (FANC), which has been in use for more than a decade. As a result, the number of recommended visits for routine ANC (for all women without specific pregnancy-related complications) changed from four visits to eight contacts.

The guideline focuses on key guiding ANC principles, pregnant-woman-centered care, maternal and fetal assessment during initial and subsequent contacts, prevention and treatment of common pregnancy problems, counseling and health promotion during ANC, as well as strengthening the health system for effective ANC coverage. The table below summarizes the key interventions in the guideline (Table 1).

How the guideline was developed?

This guideline was developed as per the WHO ANC recommendations adaptation toolkit, referring to the WHO 2016 comprehensive recommendations on ANC for pregnant women and adolescent girls. The working group has also given due consideration to the WHO expert opinion on how to develop country-specific ANC guideline.

A technical working group composed of gynecologists and obstetricians, midwives, pediatricians, and public health specialists from partners, safe motherhood technical working group, universities, Ministry of Health (MoH), and professional associations had undergone a two-day workshop on situational analysis using the format in the ANC adaptation toolkit. Taking the situational analysis finding as background information on the feasibility, equity, and acceptability of the WHO recommendations, the group reconvened and outlined the ANC guideline for Ethiopia and thoroughly examined the draft ANC guideline.

Available human resource for health, health facilities capacity, availability and affordability of commodities and supplies, and magnitude of pregnancy-related health problems were thoroughly discussed and consultation sought with experts from MoH for inclusion or exclusion of some of the interventions. Further, local, regional, and international studies specific to the interventions were rigorously reviewed. This guideline was aligned with HSTP-II, National Reproductive Health Strategy; Triple Elimination of Mother-to-Child Transmission of HIV, HBV, and Syphilis; and National Obstetric Protocols. Overall, in due course of the ANC guideline development, a series of consultative workshops was conducted by involving multidisciplinary experts and interventions were contextualized to the country's context.

Table 1. Summary of core packages of ANC interventions

Package	Interventions
1. Maternal and fetal assessment	• Institute ANC models with 8 contacts for all women without specific pregnancy-related complications at all levels of care.
	• Promote early initiation and adherence to the ANC schedule.
	• Provide universal testing for hemoglobin (Hb)/hematocrit (Hct), blood group and Rh, urine analysis, HIV, hepatitis B virus (HBV), and syphilis for all pregnant women.
	• Provide one ultrasound scan before 24 weeks of gestation (early ultrasound) for all pregnant women
2. Health promotion, prevention, and treatment during pregnancy	• Counsel pregnant women for optimal nutrition to achieve appropriate weight gain and improve her and the fetus' nutritional status for improved birth outcome.
	• Counsel all pregnant women to take safe and diversified diet and avoid unhealthy diet.
	• Counsel pregnant women to maintain regular personal hygiene and environmental sanitation.
	• Counsel all pregnant women to engage in regular work and nonstrenuous physical activity provided that the pregnant woman is capable.
	• Counsel all pregnant women to avoid alcohol, *khat*, smoking (active and passive), and other illicit drugs, throughout the pregnancy.
	• Counsel all pregnant women, and any of her family members attending ANC, on danger symptoms and signs during each contact as per the checklist and timing presented in Annex 5.
	• All pregnant women attending ANC should be counseled on birth preparedness and complication readiness starting from the first contact and ensure that the partner/family is involved.
	• Counsel pregnant woman on consumption of quality, safe, nutrient-dense, diversified food, and micronutrient supplementation to improve maternal and fetal nutritional status and health outcome.
	• Counsel on healthy eating habits and aerobic physical exercise to prevent maternal overweight and obesity during pregnancy and lactation to reduce the risk of macrosomia and avoid any additional weight gain among overweight and obese pregnant women.
	• Assess compliance and counsel for adherence of iron, folic acid, and calcium intake during each contact.
	• Counsel the woman on consumption of at least one additional diversified and nutrient-dense (rich) meal on a daily basis; and promote consumption of adequately iodized salt intake (at least 15 parts per million [PPM]).
	• Conduct nutritional assessment (dietary, clinical, and anthropometry) using mid-upper arm circumference (MUAC) measurement and weight gain monitoring for all pregnant women in every ANC contact to assess maternal nutritional status.
	• Provide daily oral iron and folic acid supplementation (60 mg elemental iron and 0.4 mg folic acid) to all pregnant women to prevent maternal anemia, puerperal sepsis, low birth weight, and preterm birth (at least 90 tabs to the maximum 180 tabs; assess compliance and counsel for adherence during each contact).
	• Investigate all pregnant women attending ANC for anemia and provide appropriate treatment (based on the level of Hb/Hct).

Package	Interventions
	• Treat all pregnant women with acute malnutrition (MUAC <23 cm) as recommended by the national guideline for the management of acute malnutrition.
	• Provide calcium supplementation with daily 1.5–2.0 gm oral elemental calcium for all pregnant women starting from 14 weeks of gestation
	• Administer at least Td-1 and Td-2 during pregnancy to all pregnant women (unless certified with Td-5) to prevent maternal and neonatal tetanus..
	• Women should be counseled on the importance of continuing the remaining doses of Td vaccine following delivery.
	• Screen the mother, the father, and the baby for Rh antigen and providing anti-D immunoglobulin 300 microgram for all Rh negative and Coomb's negative women at 28 weeks and soon after birth for women who give birth to Rh positive newborns.
	• Referring all Rh negative and Coomb's positive women, preferably before conception or early in pregnancy, to a tertiary hospital.
	• Deworm all pregnant women with a single dose of Albendazole (400 mg) or Mebendazole (500 mg) after the first trimester.
	• Counsel and Provide TDF and 3TC as PrEP for pregnant women who are at substantial risk for acquiring HIV.
	• Counseling should be done on correct and consistent use of condoms, routine screening of STIs, HIV testing, assessments of adherence and retention as part of combination HIV prevention package.
	• Low dose aspirin is recommended for prevention of pre-eclampsia in women at high-risk of developing pre-eclampsia.
	• Counsel on use of long lasting insecticidal treated bed nets, provided at the community level, and prompt diagnosis and treatment of malaria infection.
	• Test all pregnant women living in malaria endemic areas for malaria parasites and treating accordingly.
	• Perform gram stain of midstream urine to increase the detection of asymptomatic bacteriuria.
	• Treat asymptomatic bacteriuria with amoxicillin, or cephalexin tablets to reduce the risk of urinary tract infections and associated obstetric complications.
	• Screen, diagnose and treat/refer diabetes mellitus during pregnancy for specialized care.
	• Provide antihypertensive and anticonvulsant drugs to all pregnant women with severe hypertensive diseases in pregnancy (HDP) at all health facilities.
	• Apply all necessary precautions during ANC to reduce the vertical transmission of HIV, syphilis, and HBV.
	• Retest pregnant women for HIV every 3 months and for syphilis every 6 months, for those with substantial risk who were previously negative.
	• Provide screening, confirmatory Tb diagnostic test or refer to a hospital and initiate anti-Tb treatment when active Tb cases are found.
	• Provide Tb screening and diagnostic tests for family members of pregnant women diagnosed to have Tb infection.

Package	Interventions
	• Use ginger and vitamin B6 for the relief of mild nausea and vomiting in pregnancy, based on a woman's preferences and available options.
	• Refer moderate to severe nausea and vomiting to specialized care center for possible inpatient treatment.
	• Provide magnesium and calcium containing antacids for persistent heartburn for pregnant women (i.e., for those who could not respond to modified sleeping position, diet content, and meal-time).
	• Prevent constipation by increasing the high-fiber diet in the meal and frequency of water intake.
	• Encourage pregnant women to make dietary and lifestyle modifications to prevent occurrence of hemorrhoid and varicose veins.
	• Use simple and locally available methods (like compression stockings) to ease the leg cramps and improve the physical appearance of varicose veins.
	• Assess, investigate, and treat pregnant women thoroughly for abnormal vaginal discharge to alleviate disturbing symptoms and prevent obstetric and perinatal complications.
	• Investigate new onset of headache that is not responding to simple analgesics and is progressing, as it may be a symptom of an underlying serious disorder deserving thorough investigation or referral.
	• Use paracetamol as the drug of choice for treatment of headache during pregnancy.
	• Reassure the pregnant women that low-back pain, joint pain, and abdominopelvic pain are temporary problems and can be soothed with non-pharmacological methods and simple analgesics.
	• Create awareness of the risks of use of unverified over-the-counter medicines for minor pregnancy-related pains.
	• Introduce woman-held case notes, create a welcoming health facility's environment, care for women with special needs, digitalize the health system to improve the quality and utilization of ANC.
3. Strengthening the health care system for ANC	• Avail all the required infrastructure, drugs, equipment, supplies, and personnel to implement the new recommendations
	• Strengthen pre-service training, on-the-job training, mentorship, and supervision focusing on the recommendations of this guideline.
	• Introduce reproductive health services integration into routine ANC to use the opportunity to address common reproductive health problems of women.
	• Strengthen/reactivate the women health development group, community-based joint forum, and family/partner engagement to increase public awareness and increase demand for ANC and delivery services.
	• Instituting continuous quality improvement and improving the documentation and reporting of ANC.

1. Introduction

1.1. Background

Antenatal care (ANC) is a health service provided to pregnant women in the continuum of maternity care. The WHO defines ANC as the care provided by skilled health care professionals to pregnant women and adolescent girls to ensure the best health conditions for both mother and baby during pregnancy. The components of ANC include: risk identification, prevention and management of pregnancy-related or concurrent diseases, health education and health promotion. Additionally, it provides an opportunity for reproductive health service integration. Making adequate preparation for birth and emergencies is also an important ANC intervention to end preventable maternal and perinatal mortality and morbidity.

The ANC also serves as a platform for pregnant women and adolescents to have access to comprehensive reproductive health (RH) services. Thus, the ANC is not only destined to ensure a healthy mother and a healthy baby by providing quality ANC, but also to make pregnancy a healthy and positive experience for a woman and her family. These can be achieved by ensuring the physical, emotional, and mental wellbeing of pregnant women, and creating an opportunity to link ANC to other health services.

Historically, the ANC service was initiated in the 1900s in the United Kingdom. Traditional ANC was practiced until focused antenatal care (FANC) was introduced in 2002. Recent evidence noted that when compared to the previous model, the FANC model was associated with more adverse events, especially increased perinatal mortality. These findings informed the review of the ANC contact schedule, which was increased to eight contacts rather than four visits, among other interventions.

The maternal mortality ratio (401/100,000 live births) and neonatal mortality rate (33/1000 live births) in Ethiopia are among the highest in the world and Ethiopia adopted the 2016 WHO model of eight contacts to reduce maternal and perinatal mortality and morbidities.

Specific to the current guideline, within the continuum of RH care, ANC provides a platform for important health care functions, including health promotion and disease prevention, screening, diagnosis, and management. 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.

1.2. Rationale

Ethiopia has never had standalone ANC guideline although there is extensive evidence urging development of this guideline. Furthermore, this guideline is needed to address equity, quality, and standardization of ANC in Ethiopia. Moreover, it helps to increase ANC service demand and utilization to ensure maternal-perinatal health and wellbeing. The guideline also enables integration of other RH services with ANC.

1.3. Aim

The main aim of this guideline is to provide evidence-based guidance to policy makers, health programmers and health workers on comprehensive, integrated, and effective ANC service modality, thereby improving maternal and fetal-neonatal health. The guideline specifically aims at:

- Upholding health managers' capacity in ANC program planning, implementation, monitoring, and evaluation

- Enhancing ANC service quality by strengthening the health system, including capacity of health care providers
- Giving due emphasis to ANC as the main gate to comprehensive RH services and services integration
- Aligning the national ANC practice with the WHO recommendations for interventions and good clinical practices, and other emerging evidences
- Accelerating the progress toward the Health Sector Transformation Plan II targets
- Ensuring a healthy and positive pregnancy experience

1.4. Scope

The scope of this guideline defines the level of care. The overarching intent of this guideline is, therefore, to provide standardized ANC services for health promotion, prevention of pregnancy-related complications, early detection of pregnancies with problems, treatment at outpatient level and facilitate timely referral for those who require specialty care. This guideline complements other current national guidelines, protocols, and strategy documents.

1.5. Users

The primary users of this guideline are providers of ANC services at all levels (including obstetricians/gynecologists, integrated emergency surgical officers, general practitioners, health officers, midwives, nurses, health extension workers (HEWs), mentors, and supervisors) both at public and private health facilities. It also serves as a reference for policymakers, managers, partners, professional associations/societies, researchers university/college instructors in the health related fields and others.

1.6. Outcomes of interest to this guideline

This guideline has both clinical and public health outcomes of interest (Box 1). In essence, when ANC improves at individual and family level, by implementing the core principle of this guideline, it encourages more pregnant women in the community to attend ANC and helps to retain them in the continuum of care. The cumulative advantage is that ANC coverage and births at the health facility will increase, and ultimately result in a significant reduction in maternal and perinatal morbidity and mortality.

Box 1. Primary clinical and public health outcomes of interest to the guideline

A. Maternal outcomes:

- Increased maternal and family satisfaction with ANC services provided
- Universal screening of Hb/Hct, blood group and RH, HIV, syphilis, hepatitis B virus (HBV), urinalysis and tuberculosis is instituted in all health facilities
- Pregnancy-related nutritional problems (under and over nutrition) are prevented and/or corrected
- Common pregnancy-related conditions are prevented or detected early and treated
- Pregnant women are counseled to have safe and successful pregnancy outcomes
- Pregnant women are counseled on postpartum family planning

B. Fetal and neonatal outcomes:

- Preventable early pregnancy losses are prevented and associated complications are managed
- Congenital anomalies are prevented and pregnancies with congenital anomalies are managed timely
- Fetuses with problems are timely detected and delivered in a setting where neonatal care is optimal
- Premature deliveries due to preventable causes are reduced
- Perinatal mortality is reduced
- Mother-to-child transmissions of HIV, syphilis, and HBV during pregnancy, delivery, and lactation are eliminated

C. Health system outcomes:

- Quality of ANC is improved
- ANC attendees are maintained in the continuum of care with increase in ANC, skilled birth attendance and postpartum care coverage with reduced dropout

2. Key Principles of Antenatal Care

1. **Implementing the new ANC model of eight contacts schedule:** ANC services should be provided through the eight contacts schedule for all pregnant women who do not have any pregnancy-associated complications.
2. **ANC care should be woman-centered:** woman-centered care is a term that describes a philosophy of maternity care that promotes a holistic approach by recognizing and addressing each woman's social, emotional, physical, psychological, spiritual, and cultural needs and expectations. Woman-centered care should focus on the woman's unique needs, expectations and aspirations; recognizes her right to self-determination in terms of choice, control, and continuity of care.
3. **De-medicalized ANC:** care for normal pregnancy and birth should be de-medicalized and avoid over medicalization, meaning that essential care should be provided with the minimum set of interventions necessary and that less rather than more technology be applied whenever possible, and avoiding unnecessary clinical interventions.
4. **ANC should be providing efficient and timely care** to all pregnant women.
5. **ANC should be evidence-based:** meaning supported by the best available evidence.
6. **ANC should be multidisciplinary**: involving contribution from health professionals such as midwives, obstetricians, maternal-fetal medicine subspecialists, nurses, health officers, etc.
7. **ANC** should be **holistic** and concerned with intellectual, emotional, social, and cultural needs of women, their babies, and families and not only with their biological care.
8. **ANC** should respect the **privacy, dignity, and confidentiality** of women.
9. **ANC providers** should be **motivated, competent, and compassionate**.
10. Women with special needs require care in addition to the core components of basic care.

3. Principles of Preconception Care as a Basis for ANC

In the continuum of care, preconception/pre-pregnancy care is the most ignored, but equally important service for improving the outcome of pregnancy. Comprehensive care in the continuum involves risk assessment, prevention, treatment, and psychosocial support that begins pre-pregnancy and extends to the antepartum and postpartum periods. The implication is that the pre-pregnancy assessment and preparation is not limited to achieving good health during pregnancy, but also includes making good preparation for childbirth and parenting.

There is a long list of medical disorders that can worsen during pregnancy. There are also several obstetric complications that can recur in subsequent pregnancies. Undernutrition or obesity is known to affect pregnancy and pregnancy outcomes. Conceiving while using a substance, especially alcohol, tobacco, and drugs (whose teratogenic effect to the neural tube is in the first two weeks of embryonic age), is known to increase the risk of congenital anomalies and early pregnancy loss. Professional or environmental exposure to teratogenic chemicals and/or radiation increases adverse pregnancy outcomes.

The purpose of preconception care is to clinically evaluate, provide basic laboratory and imaging investigations, and treat/correct identified disorders for women (preferably in a couple) who are planning pregnancy, and avoid fetotoxic exposures. The preconception assessment (Box 2) may lead to delaying the pregnancy (until the identified disorder is treated, controlled, or becomes less risky to the pregnancy) or completely avoiding pregnancy if the pregnancy is likely to endanger the life of the woman. Pregnancy is not recommended for a woman who is diagnosed to have a life-threatening disorder (such as severe types of cardiac disease, advanced malignancy, severe obstructive lung disease, recurrent deep vein thrombosis).

Thoroughly counseling on the maternal and fetal risks of poorly controlled medical disorders, teratogenic infections and substances and providing contraception for women who are not eligible for pregnancy are parts of preconception care. Pre-pregnancy nutritional assessment using the body mass index (BMI) scale (Annex 7), maintaining e body weight to the normal range, and advising uptake of folic acid 400 µgm/0.4 mg daily starting three months ahead of the planned conception are basic components of preconception care. In case of previous delivery of a baby with neural tube defect, folic acid dose needs to be increased to 4–5 mg per day.

Box 2. Summary of pre-pregnancy assessment, counseling, and preparation

A. Assessment:

- **Potentially recurring obstetric complications experienced during previous pregnancies:** recurrent pregnancy loss, preterm labor, pre-eclampsia/eclampsia, gestational diabetes, congenital anomaly, puerperal psychosis
- **Obstetric and gynecologic surgery:** operative delivery, cerclage, loop electrosurgical excision procedure (LEEP), cone biopsy, myomectomy
- **Immunologic disorders:** autoimmune diseases
- **Medical and mental health disorders:** diabetes mellitus, thyroid disorders, hypertension, anemia, deep vein thrombosis, asthma, epilepsy, depression, anxiety disorder, etc.
- **Infectious diseases:** sexually transmitted infections (STIs) including HIV, gonococcal, chlamydial; hepatitis virus other infectious disease like malaria and tuberculosis.
- **Physical disability and developmental disorders**

B. Interventions:

- Counseling on the risk of pregnancy with uncontrolled medical conditions (anemia, diabetes mellitus, cardiac disease, renal disease, hypertension, etc.) and substance use
- Counseling and providing appropriate contraception for those not desiring pregnancy or until chronic medical conditions are stabilized
- Promoting micronutrient supplementation (iron, folic acid, calcium), promote consumption of fortified and biofortified foods, diversified and nutrient-dense foods
- Monitoring weight gain during pregnancy, body weight adjustment (overweight and obese; underweight)
- Counseling on the increased risk to the fetus (including neural tube defects) of using alcohol and illicit drugs immediately after conception and throughout pregnancy
- Counseling women at increased risk of having a fetus with a neural tube defect (those who gave birth a baby with a neural tube defect, women taking antiepileptics, and diabetics) to take high-dose supplementation of folic acid and be advised to increase their food intake of folate
- Providing pre-pregnancy vaccination (Td for all)
- Counseling on lifestyle modification (avoiding use of substances, including alcohol, tobacco, *khat*, illicit drugs; limiting caffeine intake; avoiding exposure to environmental hazards)
- Adjusting medications: using relatively safe medicines and discontinuing drugs contraindicated during pregnancy like angiotensin converting enzyme (ACE) inhibitors, isotretinoin (Accutane), and some anticonvulsant therapy like hydantoin or valproic acid]
- Counseling on the increased risk of carrying a fetus with a chromosomal abnormality after the age of 35 years

C. Socioeconomic status:

- Assessing vulnerability to domestic violence, social discrimination and stigma, and ensuring linkages to locally available services

4. Maternal and Fetal Assessment

4.1. ANC contact schedule

As per the 2016 WHO recommendation, Ethiopia is replacing the previous four-visit FANC model with the new ANC eight-contact model. In order to reduce perinatal mortality and improve the pregnancy experience of women, a minimum of eight contacts is required. For those pregnant women with identified problems, additional contacts may be scheduled as necessary.

Accordingly, the first contact is recommended to be a single contact in the first trimester (up to 12 weeks), two contacts in the second trimester (at 20 and 26 weeks of gestation), and five contacts in the third trimester (at 30, 34, 36, 38, and 40 weeks) (Table 2). The appointment schedule is: first appointment during the first trimester, second appointment 8 weeks later; the third, 6 weeks later; fourth and fifth 4 weeks apart; and then the rest every 2 weeks.

The reason for increasing the number of contacts in the third trimester is considering the increased risk of complications to the mother and the fetus during this period of gestation. This schedule enables the ANC provider to early detect and treat potential maternal and fetal complications before advancing to a severe or irreversible stage. It also gives room for the pregnant woman to share her symptoms and worries with her care provider before worsening.

In the current model, the word “visit” is replaced with “contact” as the connotation of the latter indicates an active connection between a pregnant woman and a health care provider.

Table 2. ANC contact schedule

Contacts	Gestational age of contact in weeks	Schedule of next appointment
First trimester		
1st	Up to 12	After 8 weeks
Second trimester		
2nd	20	After 6 weeks
3rd	26	After 4 weeks
Third trimester		
4th	30	After 4 weeks
5th	34	After 4 weeks
6th	36	After 2 weeks
7th	38	After 2 weeks
8th	40	

Key Interventions:

4.1a. Institute ANC models with a minimum of 8 contacts for all women without specific pregnancy-related complications at all levels of care.

4.1b. Promote early initiation and adherence to the ANC schedule.

4.2. Maternal and fetal assessment at first ANC contact

4.2.1. History and physical examination

Creating a rapport between the ANC provider and the pregnant women with a welcoming environment and respectful reception is critically important to get full information about her pregnancy history, make her comfortable for physical examination and investigations, and, above all, to create a comfort zone for the continuity of the woman in the health service.
Once communication is established, pregnancy-specific assessment can be started. The end goal of the first contact assessment is identifying clinical evidence to classify the woman as deserving routine or special care/referral. To reach either conclusion, the summary of a systematic approach is presented in Box 3.

Box 3. ANC history and physical examination during first contact

- **Identification:** name, age, address, phone number, occupation, and marital status
- **Menstrual history:** date of first last normal menstrual period and regularity of the menses; current or previous breastfeeding, use of contraception; determining the gestational age and EDD
- **History of present pregnancy:** including pregnancy symptoms, fetal kicks, and any complication to date
- **Intention of the present pregnancy:** planned/unplanned; if unplanned, wanted/unwanted
- **Past obstetric history:** number of pregnancies and outcome of each; cesarean sections; problems and complications, including bleeding, preterm births, stillbirths, and high blood pressure during pregnancy
- **Medical history:** including cardiovascular disease, renal disease, diabetes mellitus, convulsion, tuberculosis, and other past and current medical problems
- **Current medication:** including therapeutic medicines, illicit drugs, herbal/traditional remedies, drug allergy
- **Gynecologic history:** including screening for cervical cancer, gynecologic surgery, STI
- **Nutritional history:** number of food groups and frequency of meals consumed per day, craving for unusual food type, appetite, emesis
- **Social and personal history:** including use of alcohol, tobacco, exposure to second-hand smoke, *khat,* caffeine in large quantity (>300 mg/day or >3 small cups of Ethiopian coffee), or other harmful substances, assessing for intimate partner violence, female genital mutilation (FGM)
- **Mental health:** ask if pregnant woman felt depressed, sad, hopeless, irritable, worried a lot, had multiple physical complaints, felt little interest or pleasure in doing things
- **Intimate partner violence:** have you been hit, kicked, slapped or insulted, threatened, screamed, cursed at by your husband or somebody close?

Physical examination

- **General appearance** for pallor, respiratory distress
- **Vital signs:** blood pressure in left lateral or sitting comfortable position, pulse rate, respiratory rate, temperature
- **Weight and height:** height as a baseline and weight measurement for weight gain monitoring during pregnancy
- **Acute malnutrition screening:** using MUAC
- Examining the conjunctiva, oral mucosa, and nail beds for pallor
- Auscultating the chest for breathing sounds and heart sounds, any additional sounds
- **Obstetric examination:** Measuring the symphysis fundal height and doing the Leopold maneuvers
- Auscultating the fetal heartbeat with Doppler (12+ weeks), Pinard fetoscope (20+ weeks), palpating the abdomen for any mass or organomegaly
- Examining the musculoskeletal system for any gross deformity/swelling, varicose veins in the lower limb
- Examine for any sign of trauma like bruises that would indicate intimate partner violence
- Examining the FGM scar after consultation and deciding on the need of deinfibulation (in high prevalence areas)

Vaginal examination is not a routine practice during ANC. The most common indications are symptoms of STI, vulvovaginal candidiasis, bacterial vaginosis, history of FGM, screening for precancerous cervical lesion, vaginal bleeding (speculum after 28 weeks of gestation), suspected leakage of amniotic fluid (speculum), and suspected preterm labor.

4.2.2. Basic and case-specific ANC screening

The following tests should be done for all pregnant women.

- Hemoglobin (Hb) or hematocrit (Hct), blood group, and Rh
- Urine analysis: dipstick, microscopy and gram stain
- Tests for HIV, HBV, syphilis
- Ultrasound before 24 weeks: One ultrasound scan before 24 weeks of gestation (early ultrasound) is for all pregnant women to estimate gestational age, improve detection of fetal anomalies and multiple pregnancies, placentation, reduce induction of labor for post-term pregnancy, and improve a woman's pregnancy experience.

Selective or case-specific screening is recommended for gestational diabetes mellitus, Tb, and group B streptococcus (GBS). Table 3 summarizes the first three (further note is available in the next section).

Table 3. Selected clinical conditions (screening from clinical data) and methods of screening when indicated.

Clinical condition	Suggestive evidence	Methods of screening
Gestational diabetes mellitus	Personal or family history, previous macrosomia or stillbirth, obese, large-for-date uterus, family history, glycosuria	75 gm 2-hour OGTT (oral glucose tolerance test; details are in the national management protocol)
Tuberculosis (TB)	Current cough, weight loss/failure to gain weight, night sweats, and fever	Symptom-based screening and performance of diagnostic test
Group B streptococcus	Previous perinatal infection with Group B streptococcus	Vaginal swab culture

Key interventions

4.2.2a. Provide testing for hemoglobin (Hb)/hematocrit (Hct), blood group and RH, urine analysis, HIV, hepatitis B virus (HBV), and syphilis for all pregnant women

4.2.2b. Provide one ultrasound scan before 24 weeks of gestation (early ultrasound) for all pregnant women

4.2.3. Pregnancy risk identification

While all pregnancies are potentially at risk (complications often occur in pregnant women with no known risk conditions), it is important to do risk identification and stratification at first contact and in subsequent visits. Multiple assessment methods (past and present obstetric history, medical and surgical history, systematic physical examination, laboratory, and imaging) are applied to assess the health and wellbeing of the mother and the fetus as indicated above and in Table 4 below.

Table 4. Existing and newly developed high-risk conditions during pregnancy

Existing conditions	Newly developed conditions
• Age <19 and >35 years • Elderly primigravida • Short stature • Overweight/obese (BMI >25 kg/m2) or underweight (BMI <18.5 kg/m2) • Severe physical deformity/disability • Multiple pregnancy • History of three or more abortions or one or more stillbirths • Birth weight of previous baby <2500 or >4000 gm • Previous manual removal of placenta, malpresentation, malposition, post-term, pre-eclampsia/eclampsia, operative delivery • Rh-sensitized mother • Anemia, chronic medical diseases, including diabetes mellitus, renal, cardiac disease and chronic hypertension • Psychiatric illness • Unplanned and/or unwanted pregnancy • High HIV viral load, acute viral hepatitis, syphilis, TB, malaria, and other systemic infections • Imprisoned pregnant women	• Threatened abortion • History of exposure to teratogenic drugs, chemicals, or radiation • Pregnancy after sexual assault • Multiple pregnancy • Antepartum hemorrhage • New onset or superimposed hypertension • Oligohydramnios or polyhydramnios • Lack of uterine growth or confirmed fetal growth restriction • Large for date uterus • Anemia • Rh-sensitized mother • Systemic infection • Acute pyelonephritis • Recurrent lower urinary tract infection • Bacterial vaginosis • Gestational diabetes mellitus • Preterm labor • Post-term pregnancy • Abnormal presentation or abnormal lie

Existing conditions	Newly developed conditions
• Homeless pregnant women • On chronic treatment for certain disease	• Prelabor rupture of fetal membranes • Chorioamnionitis • Short cervix

4.2.4. Maternal and fetal assessment during subsequent contacts

In subsequent ANC contacts, the focus of assessment is to reevaluate the changes from the previous status and to look for new developments. Therefore, gestational age-based assessment in subsequent visits is to assess maternal wellbeing, fetal growth and wellbeing. When there are doubtful conditions, additional investigations could be requested.

On top of making a thorough assessment in every subsequent contacts (as described in Table 5), instructing the woman on how to detect her and the wellbeing of the fetus is critical. Warning about danger symptoms and signs of pregnancy is included in the counseling section.

Table 5. Assessment and interventions in subsequent ANC contacts (additional interventions are included in section 6)

Gestational age in weeks	Specific activities
20 (2nd contact)	• Review the history, physical findings and laboratory results at first contact • Ask about fetal movement • Enquire about any complaint or concern • Determine the gestational age • Observe her general appearance • Measure blood pressure • Measure weight check for weight gain • Look for pallor • Measure arm for acute malnutrition screening using MUAC • Measure the uterine fundal height • Listen for fetal heartbeat • Perform ultrasound scanning • Initiate iron-folate and calcium supplementation and counsel on adherence • Provide preventive chemotherapy(deworming) • Check for other danger signs and symptoms • Assess feeding practices and counsel on optimal maternal nutrition; extra meal/feeding frequency, diet diversity, including fruit and vegetables, animal source feeding • Assess for mental health and intimate partner violence
26 (3rd contact)	• Conduct same activities as week 20 except for ultrasound scanning • Conduct urinalysis for proteinuria and urine gram stain • Test for gestational diabetes for high-risk pregnant women

Gestational age in weeks	Specific activities
30 (4th contact)	• Conduct same activities as week 20 except for ultrasound scanning • Repeat testing for syphilis and HIV if earlier test results are negative • Repeat Hb test • Perform fetal wellbeing assessment if there is a discrepancy between fundal height and gestational age or if there is a reduction in fetal movement • Counsel on birth preparedness and complication readiness • Counsel on optimal breastfeeding practices
34 (5th contact)	• Repeat all activities done at 30 weeks • Determine fetal presentation • Test urine for proteinuria for high-risk women • Repeat testing for syphilis and HIV if not done at 30 weeks • Counsel on breastfeeding and immunization • Counsel on stimulation for early childhood development
36 (6th contact)	• Conduct all activities done at 34 weeks • Assess mental health
38 (7th contact)	• Conduct all activities done at 36 weeks • Inquire any fears, myths, worries about labor and delivery • Repeat Hb test • Advise the pregnant woman on fetal movement counting
40 (8th contact)	• Repeat all activities done at 38 weeks • Review fetal movement counting • Ultrasound scanning for fetal wellbeing assessment

5. Health Promotion, Disease Prevention and Treatment During Pregnancy

Comprehensive ANC service includes counseling and health promotion, disease prevention, and treatment during pregnancy.

5.1. Counseling and health promotion

Counseling during ANC involves a two-way confidential communication process to help pregnant women examine their personal issues, make decisions, and make plans for acting if they develop danger symptoms.

When pregnant women come to a health facility for the first time, they may be confused with myths about pregnancy and delivery and would like to clear their confusion. Some may have already experienced a bad outcome in a previous pregnancy, witnessed others having serious pregnancy-related problems, or have an established problem in the index pregnancy. Studies have shown that if pregnant women are encouraged to express their feelings, they may have a lot of questions and concerns. Therefore, they should be encouraged to ask any questions or concerns they may have.

From the provider side, using the opportunity to counsel on early detection of pregnancy-related problems, promote lifestyle modifications, make preparation for birth and any possible complications makes the ANC service impactful. Counseling should include discussion of any major problem identified with the woman and her partner, generate solutions, make decisions, plan for future regular contacts and emergencies.

In this section, three major areas of counseling and health promotion services are considered: 1) counseling on lifestyle modification throughout pregnancy, 2) counseling on danger signs and symptoms (throughout pregnancy, but tailored to the gestational age), and 3) counseling on birth preparedness and complication readiness.

5.1.1. Counseling on lifestyle modification

The need for counseling on lifestyle modification is to optimize the maternal adaptation to physiologic and anatomic changes. It also helps to maximize fetal growth.

Counseling during ANC should focus on healthy diet, maintaining hygiene; avoiding use of tobacco, alcohol, illicit drugs, and certain over-the-counter medications; getting regular exercise, sexual activity, adequate sleep and reducing stress.

Diet
Counseling on adequate, safe, nutrient rich, dense, and diversified diet with available foodstuff in the house is important. Pregnant women should take one additional meal daily during pregnancy and two extra meals daily during lactation.

Substances
Pregnant women should completely avoid the use of illicit substances (any amount of alcohol, tobacco, recreational drugs, *khat,* excessive *caffeine* intake). They should also be aware of the impact of second-hand smoking (living with a partner or family member who smokes) to the pregnancy, implying that the partner has to be involved in the counseling process for being aware of the fetal risk and avoiding smoking around the mother. The counseling should also include on avoiding over-the-counter medicines unless otherwise proved to be safe for pregnancy. Daily caffeine intake should not exceed 300 mg, which is equivalent to three small cups of Ethiopian coffee.

Exercise
During ANC contacts, pregnant women should be encouraged to have daily routine physical activity like walking for half an hour daily but it should not be strenuous. Exercises should not be practiced in supine position. Employed pregnant women have the right to use their maternity leave, but that does not mean it is a leave for physical rest.

Sexual activity
Pregnant women should also be aware of that sexual intercourse during pregnancy is not associated with adverse pregnancy outcome. However, contraindications for sexual intercourse, including vaginal bleeding, leakage of liquor, and preterm labor should be informed.

Hygiene and sanitation for infection prevention
During pregnancy, women should be especially careful about personal hygiene and environmental sanitation. Keeping the body clean helps prevent infection. Handwashing with soap is the most important hygiene action she can take, especially before preparing food and after going to the toilet. A pregnant woman should wash her body regularly with clean water. Dental hygiene is important during pregnancy and counseling on hygiene includes regular cleaning of the teeth with a dental stick or a toothbrush and toothpaste. Promoting the use of safe water, sanitation, and hygiene services is fundamental to break the cycle of infection and reinfection and sustainable control of soil-transmitted helminth infection.

Key Interventions
5.1.1a. Counseling pregnant women for optimal nutrition to achieve appropriate weight and improve her and the fetus' nutritional status for improved birth outcome.
5.1.1b. Counsel all pregnant women to take safe and diversified diet and avoid unhealthy diet.
5.1.1c. Counsel pregnant women to maintain regular personal hygiene and environmental sanitation.
5.1.1d. Counsel all pregnant women to engage in regular work and nonstrenuous physical activity, provided that the pregnant woman is capable.
5.1.1e. Counsel all pregnant women to avoid alcohol, *khat*, smoking (active and passive), and other illicit drugs, throughout the pregnancy.

5.1.2. Counseling on danger symptoms and signs

Since most women have uneventful pregnancies and childbirths, pregnant women may overlook symptoms and signs of serious maternal and fetal complications during pregnancy. Moreover, pregnant women should be aware that having previous uneventful pregnancies does not guarantee the normality of the index pregnancy. Sudden and unpredictable complications can occur at any time in any woman during any pregnancy. Therefore, the ANC provider should ensure that the pregnant woman and her family are aware of the common danger symptoms and signs and are ready to act without delay to seek health care (Box 4).

Box 4: Checklist for counseling danger symptoms and signs for common problems of pregnancy, starting from the first ANC contact

Counsel the pregnant woman and any of her family members to report as soon as possible any of the following conditions:

- Vaginal bleeding of any amount and anytime during pregnancy
- Sudden gush of fluid or leaking of fluid from the vagina
- Offensive vaginal discharge
- Chills, rigor, or fever
- Severe headache not relieved by simple analgesics (e.g. paracetamol)
- Dizziness and blurring of vision
- Persistent nausea and vomiting
- Persistent cough (dry or productive)
- Swelling (hand and face)
- Decreased or loss of fetal movement
- Convulsions and/or loss of consciousness
- Premature onset of contractions/pushing down pain (before 37 weeks)
- Severe or unusual abdominal pain (flank, epigastric, or right upper quadrant pain)
- Skin rash

Recommendation:

5.1.2a. Counsel all pregnant women and any of her family member attending ANC on danger symptoms and signs during each contact as per the checklist and timing presented in Annex 5.

5.1.3. Counseling on birth preparedness and complication readiness

Preparing the woman and her family for childbirth and parenthood should begin from the first ANC contact. This is applicable to both first-time pregnant and experienced women. The complication readiness is a continuation of creating awareness of danger symptoms and signs. Every pregnancy is at risk until proven otherwise, therefore, all pregnant women and their family members have to be ready to take essential actions and make multifaceted preparations to respond to the complications that might occur during childbirth.

The components of a multifaceted birth preparedness and complication readiness plan include being aware of the danger symptoms and signs and preparing for immediate actions. Every woman and her family should have a plan for the following:

- Skilled attendance at birth
- Place of delivery (in consultation with the ANC provider)
- How to get to health facility (including transportation)
- Preparing essential items for childbirth
- Saving money for emergency transport (in case ambulance is not accessible)
- Preparing support during and after birth (family or friends)
- Arranging a way of communication in emergency situations
- Designating a decision-maker on the woman's behalf (including giving consent when she is unable to do that)

- Keeping pregnant women in the maternity waiting home to bridge the geographic gap of accessing obstetric care during emergency situations is also an essential component of birth preparedness and complication readiness.
- Establishing a strong inter-facility linkage and referral system is another important undertaking for the effectiveness of birth preparedness and complication readiness efforts.

Key intervention

5.1.3a. All pregnant women attending ANC should be counseled on birth preparedness and complication readiness starting from the first contact and ensure that the partner/family is involved in preparations for action

5.1.4. Counseling on other issues

Counsel on the importance of family planning

- Explain that after birth, if she is sexually active and is not exclusively breastfeeding, she can become pregnant as early as 4 weeks after delivery
- Counsel about the different family planning options including immediate postpartum contraceptives
- Advise that waiting at least 2 years between pregnancies is healthier for the mother and the child

Counsel on infant and young children nutrition

- Advise on optimal breastfeeding: early initiation, giving colostrum, avoiding prelacteal and bottle feeding, and exclusive breastfeeding
- For women who are HIV positive, counsel on the options for feeding for her neonate, still encouraging exclusive breastfeeding
- Advise on child nutrition (after 6 months), growth and development monitoring, and immunization
- Promote deworming for children, therapeutic zinc supplements for childhood diarrhea
- Advise on danger signs and symptoms and early reporting of child illness and malnutrition

Counsel on child immunization

Immunization is one of the effective strategies in reducing child morbidity and mortality. Pregnant women should be counseled and encouraged to vaccinate their children.

Counsel on stimulation for early childhood development

- Counsel parents to talk softly and sing to the unborn baby every day for optimal development as the baby can hear, recognize their voice after birth, and be happy. Failing to do this will result in poor attachment and love after birth.
- The father needs to support the mother to stay relaxed, calm, and happy during pregnancy through stronger family relationship since stress during pregnancy can cause preterm birth, low birth weight, or impaired brain development in the fetus.

5.2. Nutritional interventions

Maintaining good nutrition and a healthy diet during pregnancy is critical for the health of the mother and fetus. Pregnancy requires a healthy diet that includes adequate intake of energy, protein, vitamins, and minerals to meet maternal and fetal needs. In Ethiopia, for many pregnant women, dietary intake of vegetables, meat, dairy products, and fruit is often insufficient. Maternal undernutrition is highly prevalent and is recognized as a key determinant of poor perinatal outcomes. Maternal undernutrition such as underweight or thinness (BMI<18.5kg/m2) and micronutrient deficiencies (anemia, iodine, Vitamin A and D, Zinc, calcium, etc.) causes fetal growth restriction and low birth weight.

In addition, overweight and obesity are becoming a public health problem in Ethiopia. Hence, ensuring optimal maternal nutrition with appropriate counseling and providing supplements (as per the resource allows to do so) are essential components of ANC.

5.2.1. Nutritional counseling

Nutrition education and counseling is a widely used strategy to improve the nutritional status of women during pregnancy. Counseling primarily focuses on:

- Promoting a healthy diet by increasing the quality, quantity, and diversity of food consumed as well as ensuring its safety
- Promoting adequate weight gain during pregnancy through weight measurement, interpretation, and counseling
- Promoting food and micronutrient supplements during pregnancy
- Promoting healthy eating habits and physical exercise to prevent maternal overweight and obesity during pregnancy (to reduce the risk of both small for gestational age infants, macrosomia, neonatal hypoglycemia, gestational diabetes mellitus, and other poor obstetric outcomes)
- Assessing compliance and counseling for adherence to iron, folic acid, and calcium supplementation during each contact
- Promoting consumption of at least five out of the ten food groups, consumption of nutrient-dense foods, fortified and biofortified foods, fruit and vegetables, animal source foods.
- Women with normal BMI before pregnancy should achieve 10 to 12.5 kg during pregnancy
- Counseling should also emphasize that excess weight gain is not healthy during pregnancy
- Food safety and quality is important during pregnancy. Some of food items that need to be avoided include: raw meat (risk of toxoplasmosis, tapeworm, schistosomiasis, etc.), raw egg (risk of salmonella food poisoning), mold-ripened soft cheese (risk of listeriosis for the fetus), unwashed vegetables and fruits, unpasteurized or raw milk, processed and junk/packed foods (overweight and non-communicable diseases), excess caffeine (risk of low birth weight)

Recommended food groups for pregnant women—at least five out of ten:

1. Grains, white roots and tubers, and plantains (“starchy staples”)
2. Pulses (beans, peas, and lentils)
3. Nuts and seeds
4. Dairy
5. Meat, poultry, and fish
6. Eggs
7. Dark-green leafy vegetables
8. Other vitamin A-rich fruits and vegetables
9. Other vegetables
10. Other fruits

Key Interventions:

5.2.1a. Counsel pregnant woman on consumption of quality, safe, nutrient-dense, diversified food, and micronutrient supplementation to improve maternal and fetal nutritional status and health outcome.

5.2.1b. Counsel on healthy eating habits and aerobic physical exercise to prevent maternal overweight and obesity during pregnancy and lactation to reduce the risk of macrosomia.

5.2.1c. Assess compliance and counsel for adherence of iron, folic acid, and calcium intake during each contact.

5.2.1d. Counsel the woman on consumption of at least one additional diversified and nutrient-dense (rich) meal on a daily basis; and promote consumption of adequately iodized salt intake (at least 15 parts per million [PPM]).

5.2.2. Prevention and treatment of maternal malnutrition during pregnancy

A healthy diet during pregnancy contains adequate energy, protein, vitamins, and minerals, which are included in the majority of meals.

Macronutrient requirement

Women are advised to increase their daily calorie intake during pregnancy according to their pre-pregnancy body weight, physical activity, and gestational age. Counseling mothers to get at least one additional nutrient-dense, safe, and diverse meals per day during pregnancy to fulfill the extra energy and protein requirement is important.

Energy requirements vary significantly depending on a woman's age, BMI, and activity level. Caloric intake should, therefore, be individualized based on these factors (as summarized in Table 6).

Mid-upper arm circumference (MUAC) is used to identify acute malnutrition in individual woman. Thus, MUAC and weight measurement should be determined during each ANC contacts to assess maternal nutritional status and to act accordingly. MUAC <23 cm indicates acute malnutrition and is an indication for supplementation with ready-to-use foods (e.g., Plumpy'Nut, corn-soy blend [CSB++]) until the measurement is in the normal range. Weight gain recommended during pregnancy is based on the pre-pregnancy BMI as shown Table 6. Refer to Annex 7 to calculate BMI.

Table 6. Recommended maternal weight gain during pregnancy and dietary diversification

Baseline/ pre-pregnancy BMI in kg/m^2	Recommended weight gain in kg	Dietary diversification
Underweight (<18.5)	12.5–18	More calorie and protein diet adequate vegetables and fruits
Normal (18.5 to <25)	11.5–16	Moderate carbohydrate and protein diet adequate vegetables and fruits
Overweight (25 to <30)	7–11.5	Normal carbohydrate and protein diet, very low fat, more vegetables and fruits
Obese (≥30)	5–9	Lower carbohydrate and protein diet, more vegetables and fruits, avoid fat foods

Note: Major calorie sources are carbohydrate and fat foods (see Annex 8). Steady increase of 1.5–2 kgs weight per month is expected from 4 month of pregnancy. Cumulative average increase of 10–12 kgs weight is expected from pregnancy till birth of a child.

Iron and folic acid supplementation

In Ethiopia nutritional (iron or folate) deficiency, malaria, and hookworm infestation are the major causes of anemia in pregnancy. Over 50% of anemia during pregnancy is contributed by iron deficiency, reflecting the increased demand for iron. Other causes of nutritional deficiency anemia during pregnancy are folic acid (vitamin B9) or vitamin B12 deficiency.

The average daily requirement of elemental iron in normal pregnancy is 3.5 mg/dl. Diets that are rich in iron include red meat, liver, poultry, fish, dried beans and peas, iron-fortified cereals, biofortified food, etc.

Supplementary dose: All pregnant women should take 60 mg elemental iron (ferrous sulphate, ferrous fumarate, or ferrous gluconate) and 0.4 mg folic acid daily for six months (180 tabs).

Anemia classification and treatment

Hemoglobin less than <11 g/dl defines anemia during pregnancy (Table 7). The finding of normocytic (MCV<80) and hypochromic red blood cell (RBC) (peripheral morphology) is suggestive of iron deficiency anemia, while macrocytic (MCV>100) and normochromic suggests folic acid or Vitamin B12 deficiency anemia.

Use either full blood count testing or haemoglobinometer to determine hemoglobin/hematocrit level and detect anemia.

Table 7. Degree of anemia and possible treatment options

HB level	Degree of anemia	Immediate action
≥ 11 gm/dl	Normal	Iron-folate prophylactic dose
9–10.9 gm/dl	Mild	Therapeutic iron dose + peripheral RBC morphology and RBC indices*
7–8.9 gm/dl	Moderate	Therapeutic iron dose + peripheral RBC morphology and RBC indices, close follow-up*
< 7 gm/dl	Severe	Referral to a hospital for complete investigation and possible blood transfusion; continue therapeutic iron dose then after

- *If no adequate response to therapeutic iron dose, refer to a hospital for a complete investigation.
- Therapeutic dose: 60 mg elemental iron, BID in 24 hours until the Hb rises to ≥11gm/dl, to be followed by prophylactic dose.

Multiple micronutrient supplementation

Micronutrients are only needed in very small quantities but are essential for normal physiological function, growth, and development. Antenatal multiple micronutrient supplements that include iron, folic acid, zinc, and several vitamins and minerals (13 -15 in total) can be provided as an alternative if feasible.

Calcium supplementation as component of nutritional intervention

Dietary counseling of pregnant women should promote adequate calcium intake through locally available, calcium-rich foods such as milk, other dairy products, and green leafy vegetables to improve maternal nutritional status and reduce risk of pre-eclampsia/eclampsia. Calcium supplementation reduces the risk of leg cramps. The calcium and iron tablets should not be simultaneously taken.

Key interventions:

5.2.2a. Conduct nutritional assessment (dietary, clinical, and anthropometry) using mid-upper arm circumference (MUAC) measurement and weight gain monitoring for all pregnant women in every ANC contact to assess maternal nutritional status and act accordingly.

5.2.2b. Provide daily oral iron and folic acid supplementation (60 mg elemental iron and 0.4 mg folic acid) to all pregnant women to prevent maternal anemia, puerperal sepsis, low birth weight, and preterm birth (at least 90 tabs to the maximum 180 tabs; assess compliance and counsel for adherence during each contact).

NB: Some women may experience GI side effect (heartburn, nausea, and vomiting) that may affect adherence. Providers should be ready to address and respond to pregnant women's concern related to these side effects.

5.2.2c. Investigate all pregnant women attending ANC for anemia and provide appropriate treatment (based on the level of Hb/Hct).

5.2.2d. Treat all pregnant women with acute malnutrition (MUAC <23 cm) as per the national guideline for the management of acute malnutrition.

5.2.2.e. Provide calcium supplementation with daily 1.5–2.0 gm oral elemental calcium for all pregnant women starting from 14 weeks of gestation.

5.3. Other preventive antepartum interventions

The other preventive antepartum interventions targets vaccine-preventable diseases, preventing RhD isoimmunization, asymptomatic infections, established infections and disorders, and common pregnancy conditions. Detail management plans for seriously complicated and emergency cases are not included.

5.3.1 Vaccination during pregnancy

Vaccination during pregnancy has a triple life protection purpose (the mother, the fetus, and the infant). The tetanus toxoid (TT) vaccine has been replaced with tetanus–diphtheria (Td) vaccine (Table 8).

Live-virus vaccines for measles, mumps, and rubella are not recommended during pregnancy, but during immediate postpartum and pre-pregnancy period is possible.

Table 8. Tetanus–diphtheria vaccination schedule during pregnancy and beyond

Dose	Timing of administration*	Protective effectiveness (duration of protection)
Td-1	At the first ANC contact	0%
Td-2	At least 4 weeks after Td-1	80% (1–3years)
Td-3	At least 6 months after Td-2	95% (5 years)
Td-4	At least 1 year after Td-3	99% (10 years)
Td-5	At least 1 year after Td-4	99% (all childbearing years)

* Note: For those who start ANC later, the second dose should be administered at least 2 weeks before the delivery due date. Women who are unable to complete the Td-3 to Td-5 doses during the index pregnancy and non-pregnant state can be provided the vaccines in subsequent pregnancies.

Key Interventions:

5.3.1a: Administer at least Td-1 and Td-2 during pregnancy to all pregnant women (unless certified with Td-5) to prevent maternal and neonatal tetanus.

5.3.1b. Women should be counseled on the importance of continuing the remaining doses of Td vaccine following delivery**.**

5.3.2. Preventing RhD isoimmunization

Rh isoimmunization is hemolytic anemia of fetus/neonate secondary to the production and passage of antibodies against fetal Rh antigen. Rh sensitization usually occurs during labor and delivery when there is increased risk of feto–maternal hemorrhage.

Preventing Rh isoimmunization in Rh negative pregnant women is one of the most effective interventions in obstetrics. Administration of anti-D immunoglobulin during antepartum and postpartum period for the prevention of Rh isoimmunization is highly effective prevention method.

Anti-D immunoglobulin is administered to unsensitized Rh negative woman whose partner is Rh positive. It is given at 28 weeks of gestation; in the presence of risk factors for feto–maternal hemorrhage (antepartum hemorrhage, obstetric procedures, etc.); and it is given during the immediate postpartum period after testing the neonate's Rh.

After delivery, the blood group of the neonate should be determined from the umbilical cord blood, and anti-D immunoglobulin administered if the cord blood group is Rh positive. The anti-D administration should not be delayed (as soon as possible).

NOTE: When a pregnant woman is diagnosed Rh negative, her partner's Rh should be determined. If he is Rh negative, there is no need to further investigate or administer anti-D. If he is Rh positive, indirect Coomb's test should be determined; Coomb's positive mothers (sensitized) do not need anti-D, but should be referred to a tertiary hospital. After birth, the neonate's blood group should be determined, and decision should be made accordingly. Anti-D should be administered in all subsequent pregnancies after checking for sensitization.

Key interventions:

5.3.2a. Screen the mother, the father, and the baby for Rh antigen and provide anti-D immunoglobulin 300 microgram for all Rh negative and Coomb's negative women at 28 weeks and soon after birth for women who gave birth to Rh positive newborns.

5.3.2b. Refer all Rh negative and Coomb's positive women, preferably before conception or early in pregnancy, to a tertiary hospital.

5.3.3. Deworming during pregnancy

From different parts of Ethiopia, an overall prevalence of intestinal parasitosis ranges from 32% to 70%, which qualifies one of the WHO's criteria (>20% prevalence) for mass deworming.

During pregnancy administer a single dose of albendazole (400 mg) or mebendazole (500 mg) after the first trimester. Albendazole, a broad spectrum anthelmintic (including the common tapeworms), should not be administered in the first trimester.

If the woman's health condition is deteriorating because of massive intestinal parasitosis (usually due to Ascariasis or tapeworm) or anemia (usually hookworm), mebendazole can be administered in the first trimester.

If a pregnant woman is symptomatic (particularly associated with intestinal parasitosis causing diarrheal diseases and tapeworm infestation), confirm the diagnosis with laboratory investigations and treat the underlying cause. Promote personal hygiene and environmental sanitation.

Key interventions:

5.3.3a. Deworm all pregnant women with a single dose of albendazole (400 mg) or mebendazole (500 mg) after the first trimester.

5.3.4. Pre-exposure prophylaxis for HIV prevention

Taking an antiretroviral for pre-exposure prophylaxis (PrEP) is highly recommended when there is a substantial risk of acquiring HIV.

The target beneficiaries for PrEP service are:

- Consenting HIV negative female sex workers
- HIV negative partners of sero-discordant couples
- HIV negative pregnant and breastfeeding women at substantial risk of HIV infection during antenatal and postnatal follow-up visits with HIV-positive partner, which also required conducting routine partner testing for HIV

PrEP is not an emergency intervention; it requires consistent, daily use for people who have sexual intercourse with a known HIV-positive person or person of unknown status, but at high risk of acquiring the virus.

Pregnant women should receive PrEP regardless of gestational age with a combination of tenofovir disoproxil fumarate (TDF) + lamivudine (3TC). When PrEP is taken daily, it is highly effective in preventing HIV infection. If the pregnant woman is HIV positive and her husband/partner is negative, he should be counseled to use condoms and PrEP.

Key interventions:

5.3.4a. Counsel and provide TDF and 3TC as PrEP for pregnant women who are at substantial risk for acquiring HIV.

5.3.4b. Counseling should be done on correct and consistent use of condoms, routine screening of STIs, HIV testing, assessments of adherence and retention as part of combination HIV prevention package.

5.3.5. Prevention of pre-eclampsia

The Ethiopia Public Health Institute study has concluded that the dietary calcium intake of childbearing age women in Ethiopia is very low (nearly 60–70% less than the recommended amount).

Dietary counseling of pregnant women should promote adequate calcium intake through locally available, calcium-rich foods. The recommended daily calcium supplementation is 1.5–2.0 g oral elemental calcium starting from 14 weeks of gestation.

Dividing the dose of calcium may improve adherence, preferably taken at mealtimes.

Low dose aspirin is recommended for prevention of pre-eclampsia in women at high risk of developing pre-eclampsia. After risk stratification, women with high risk of pre-eclampsia should be referred to hospital for initiation of aspirin.

Negative interactions between iron and calcium supplements may occur. Therefore, the two nutrients should preferably be administered at least 3 hours apart rather than concomitantly. Pregnant women with high risk of pre-eclampsia should be referred to a hospital for further management.

Key interventions:

5.3.5a. Low dose aspirin is recommended for prevention of pre-eclampsia in women at high risk of developing pre-eclampsia.

5.3.6. Prevention of malaria

Ethiopia is generally considered as a low-to-moderate malaria transmission intensity country.

Malaria infection during pregnancy is a major public health problem, with substantial risks for the mother, her fetus, and the newborn. It is recommended to use a package of interventions for preventing and controlling malaria during pregnancy, which includes promotion and use of insecticide-treated nets and appropriate case management with prompt and effective treatment.

WHO recommends administration of IPTp with sulfadoxine–pyrimethamine (IPTp-SP) in areas with moderate to high transmission of *Plasmodium falciparum* starting in the second trimester with one-month intervals. All pregnant women in malaria endemic areas should be tested for malaria.

Key interventions:

5.3.6a. Counsel on use of insecticidal treated bed nets, provided at the community level, and on prompt diagnosis and treatment of malaria infection.

5.3.6b. Test all pregnant women living in malaria endemic areas for malaria parasites and treating accordingly.

5.4. Treatment of common antepartum problems

Health conditions with potential to progress and cause serious maternal and fetal complications during pregnancy include asymptomatic bacteriuria, TB, hypertension, and diabetes mellitus.

5.4.1. Asymptomatic bacteriuria during pregnancy

During pregnancy, the prevalence of asymptomatic bacteriuria ranges from 5%–20%. Asymptomatic bacteriuria increases the risk of developing cystitis, acute pyelonephritis, and obstetric complications, including spontaneous preterm delivery, prelabor rupture of fetal membranes (PROM), and chorioamnionitis.

All pregnant women should be screened for asymptomatic bacteria during the first antenatal contact.

Diagnosis of asymptomatic bacteriuria is made when the load of a single bacteria is $\geq$ 100,000 colony forming units/ml of midstream urine culture. If the midstream urine culture is not possible, the second alternate is gram staining the midstream urine. Dipstick test (detecting nitrites and leukocytes) alone has low sensitivity to diagnose asymptomatic bacteriuria.

Treating asymptomatic bacteriuria markedly reduces the risk of infection complications. Administer amoxicillin, or cephalexin tablets to treat asymptomatic bacteriuria.

Key interventions:

5.4.1a. Perform gram stain of midstream urine to increase the detection of asymptomatic bacteriuria.

5.4.1b. Treat asymptomatic bacteriuria with amoxicillin, or cephalexin tablets to reduce the risk of urinary tract infections and associated obstetric complications.

5.4.2. Diabetes mellitus in pregnancy

The management principle of diabetes mellitus in pregnancy is primarily making early diagnosis and providing appropriate treatment to minimize the maternal and fetal complications.

This is achieved by maintaining good glycemic control through lifestyle modifications (including avoiding hyperglycemic diets, carrying out moderate intensity regular exercise, and avoiding chronic stress) and/or using administration of drugs (oral hypoglycemic agents or insulin). Pregnant women with a diagnosis of diabetes mellitus need specialized care.

Key intervention:

5.4.2a. Screen, diagnose, and treat/refer diabetes mellitus during pregnancy for specialized care.

5.4.3. Hypertensive disorders of pregnancy

In Ethiopia, the 2020 maternal perinatal death surveillance and response report has shown that hypertensive disorders of pregnancy (HDP) is the second most common cause of maternal deaths. HDP is also one of the most common causes of premature delivery and perinatal mortality.

Treatment of HDP includes administration of antihypertensive drugs (hydralazine, nifedipine, methyldopa), anticonvulsants (magnesium sulphate, phenytoin, diazepam), and opening IV-line with ringer lactate or normal saline. If the woman is convulsing, the convulsion must be controlled before expediting the referral. Detailed description is available in the national obstetric management protocol.

Key interventions:

5.4.3a. Provide antihypertensive and anticonvulsant drugs to all pregnant women with severe HDP at all health facilities.

5.4.4. HIV, syphilis, and/or HBV infection during pregnancy

Sexually transmitted infections during pregnancy can pose serious health risks for the mother and the fetus. As a result, screening for human immunodeficiency virus (HIV), hepatitis B, and syphilis should be done for all pregnant women to diagnose and treat early (Table 9). Refer to the national guideline for prevention of mother-to-child transmission of HIV, syphilis, and hepatitis B virus.

Table 9. Treatment protocol for HIV, syphilis, and HBV during pregnancy

Diagnosis	Treatment for the mother and prophylaxis for the fetus
HIV positive	TDF + 3TC + DTG or TDF + 3TC + EFV 400 mg
Syphilis positive	Benzathine penicillin 1.8 g (2.4 million units) IM, stat (1.2 MU in each buttock) weekly for three consecutive weeks OR Procaine penicillin 1.5 g IM daily for 10 days OR Erythromycin orally 500 mg, three times a day, for 7 days (for penicillin allergic)
HBV positive	• For those women with positive HBSAg, HBV DNA viral load should be determined. • HBV viral load greater than 20,000 international units per milliliter (IU/mL) of blood indicates that the virus is active and an indication to give tenofovir for the woman starting from 28 weeks of gestation until delivery. • If the laboratory test for HBV viral load is not available, HBeAg should be determined to decide on the need of maternal treatment. • For women with detectable HBeAg, give tenofovir starting from 28 weeks of gestational age until delivery. • Linkage/referral for medical evaluation is also important (assessment of eligibility for life-long treatment and follow-up). • Take note that management of HBV for positive women requires specialized care.

Key interventions:

5.4.4a. Implement early universal testing for HIV, syphilis, and HBV, including testing and treating partners and children.

5.4.4b. Apply all necessary precautions during ANC to reduce vertical transmission of HIV, syphilis, and HBV.

5.4.4c. Retest pregnant women for HIV every 3 months and for syphilis every 6 months, for those with substantial risk who were previously negative.

5.4.5. Tuberculosis

Ethiopia is one of the 22 WHO high Tb burden countries, with an estimated prevalence of active Tb of 370/100,000 pregnant population. Tb seriously affects maternal health and pregnancy outcomes by reducing the fetal birth weight, increasing mother-to-child transmission of HIV and maternal and perinatal morbidity and mortality.

Considering the high burden of the disease, conduct symptom based screening of Tb for all pregnant women with constitutional symptoms (low grade intermittent fever, night sweat, cough for more than two weeks).

Pregnant women who are at risk for Tb infection are those who are exposed to Tb infected persons, immunocompromised (HIV, malignancy, chemotherapy, radiotherapy), chronic steroid and cytotoxic drug users (autoimmune disease), diabetic, malnourished, chronic stress etc.

During pregnancy, latent Tb treatment should be delayed for 2–3 months after birth unless there is a risk for progression to active Tb (severely immunocompromised, recent contact with infectious Tb disease). Active Tb, however, should be treated even in the first trimester. Selected anti-Tb drugs (isoniazid, rifampin, and ethambutol) are safe during pregnancy. Other anti-Tb drugs such as aminoglycosides (including streptomycin), fluoroquinolones, pyrazinamide (unknown effect on the fetus) are contraindicated during pregnancy.

Key Interventions:

5.4.5a. Provide routine screening and confirmatory Tb diagnostic test or referring to a hospital and initiating anti-Tb treatment when active Tb cases are found with isoniazid, rifampin, or ethambutol.

5.4.5b. Provide Tb screening and diagnostic tests to the family members of pregnant women diagnosed to have Tb infection.

5.5. Interventions for common pregnancy conditions

The anatomic and physiologic changes during pregnancy can create pain and discomfort for the pregnant woman; these are referred to as "common pregnancy conditions." Unlike serious illnesses during pregnancy, common pregnancy conditions are not exceptionally harmful, rarely debilitating condition, requiring hospitalization, or aggressive therapeutic interventions, but can be a distressing.

Many of the common pregnancy conditions are medically treatable and simple psychological reassurance may suffice. When there is intractable pain, exaggerated pregnancy symptoms (like persistent vomiting), and constitutional symptoms of infection, a thorough evaluation is warranted; minor pregnancy symptoms/disorders are diagnosis of exclusion.

5.5.1. Nausea and vomiting

Nausea and vomiting of mild degree (morning sickness) is a common phenomenon experienced in about 70% of pregnant women. It usually occurs during the first trimester of pregnancy, but up to 20% of women may experience nausea and vomiting beyond 20 weeks of gestation. Only a few mothers (about 1%–2%) develop the severe form of nausea and vomiting (hyperemesis gravidarum) that could result in hypotension, electrolyte imbalance, and marked weight loss in pregnant women who are late in receiving medical treatment.
Women should be informed that symptoms of nausea and vomiting usually resolve in the second half of pregnancy. Ginger and vitamin B6 are recommended for relief of mild degree of nausea and vomiting in pregnancy, based on a woman's preference and available options. Moderate to severe degrees of nausea and vomiting need specialized care.

Key interventions:

5.5.1a. Use ginger and vitamin B6 for the relief of mild nausea and vomiting in pregnancy, based on a woman's preferences and available options.

5.5.1b. Refer moderate to severe nausea and vomiting to specialized care for possible inpatient treatment.

5.5.2. Heartburn

Heartburn is one of the most common gastrointestinal problems during pregnancy and can be experienced starting in the first trimester with increasing frequency as the pregnancy advances and usually spontaneously ameliorates after delivery. At least 30%–50% of pregnant women experience heartburn, mainly due to the lower esophageal sphincter relaxation effect of estrogen and progesterone and delayed gastric emptying. It may be worsened by heavy meals, fatty and spicy foods, chocolate, caffeine, and some drugs (such as nifedipine, chlorpromazine, promethazine, hyoscine).

The diagnosis is based on the patient's complaint and does not usually need further investigation. The clinical presentation is feeling burning pain in the retrosternal area, commonly accompanied by regurgitation, and occasionally by nausea, vomiting, indigestion, and epigastric pain.

Lifestyle modification (modifying the diet content and habit/meal frequency), not eating at bed-time, elevating the bed/increasing pillows number, and avoiding alcohol and tobacco can improve the heartburn episodes and severity. For persistent heartburn, antacids (the commonly available magnesium hydroxide or magnesium trisilicate) can be prescribed. If available, calcium containing antacids are also safe and effective. However, aluminum hydroxide antacids should not be used as they can aggravate constipation, and there is concern of fetal neurotoxicity and developmental delay. If the heartburn persisted after treatment with antacid, further evaluation is needed.

Key intervention:

5.5.2a. Provide magnesium and calcium containing antacids for pregnant women with persistent heartburn (i.e., for those who do not respond to modified sleeping position, diet content, and meal-time).

5.5.3. Constipation

Constipation is the second most common gastrointestinal disorder during pregnancy, experienced by 35%–40% of pregnant women in the first and second trimester and 20% in the third trimester, which is also mainly associated with the bowel or smooth muscle relaxation effect of progesterone.

Mechanical causes of constipation and medical disorders predisposing to constipation (diabetes mellitus and hypothyroidism) should be ruled out.

Adequate water intake and a high-fiber diet (wholegrain foods, fruit, and vegetables) are usually effective in preventing constipation. Laxatives (such as lactulose, polyethylene glycol) and anti-hemorrhoid creams should be reserved for refractory cases. Commonly used laxatives (such as bisacodyl, mineral or castor oil) should be avoided.

Key intervention:

5.5.3a. Prevent constipation by increasing the high-fiber diet in the meal and frequency of water intake

5.5.4. Hemorrhoid and varicose veins

Hemorrhoid (varicose veins of the lower rectum) and varicose veins of the legs are common disorders during pregnancy. Despite the high incidence of hemorrhoids during pregnancy, many women feel embarrassed to disclose it to their ANC providers, implying the need for enquiring about its occurrence during ANC assessments.

Dietary modification to prevent constipation, hydrotherapy (sitz bath), avoiding prolonged sitting and vigorous straining, and locally applying anti-hemorrhoid agents are the commonly used conservative methods to reduce the size of hemorrhoids.

For varicose veins of the legs, mechanical compression stockings, leg elevation, not standing for long hours, and water immersion are the recommended conservative management options.

If the above treatment options cannot bring about improvement, the woman should be referred for further management.

Key interventions:

5.5.4a. Encourage pregnant women to make dietary and lifestyle modifications to prevent occurrence of hemorrhoid and varicose veins.

5.5.4b. Use simple and locally available methods (like compression stockings) to ease the leg cramps and improve the physical appearance of varicose veins.

5.5.5. Abnormal vaginal discharge

The purpose of assessing abnormal vaginal discharge is not only to alleviate the disturbing symptoms, but also to prevent the associated pregnancy risks (preterm birth, intra-amniotic infection, PROM, perinatal sepsis, postpartum pelvic inflammatory disease, and ophthalmia neonatorum).

Abnormal vaginal discharge is characterized by a change in color (yellow, green, or gray), change in odor (strong and foul odor), redness, itching, and vulval swelling or ulceration.

Syndromic management for pregnant women may increase the overtreatment and exposing the fetus to the cocktail of drugs; therefore, if possible, etiologic diagnosis and management is preferred.

Treatment for confirmed or suspected gonococcal infection (ceftriaxone), chlamydia (azithromycin or erythromycin), trichomoniasis and bacterial vaginosis (metronidazole in the 2nd and 3rd trimesters), and vulvovaginal candidiasis (miconazole, imidazole or clotrimazole) can be safely provided to pregnant women. Simple but important is counseling pregnant women to wear loose cotton underwear and loose-fitting clothes to reduce the risk of vulvovaginal candidiasis. For STI suspected and confirmed cases, the partner must be treated.

Recommendation:

5.5.5a. Assess, investigate, and treat pregnant women thoroughly for abnormal vaginal discharge to alleviate disturbing symptoms and prevent obstetric and perinatal complications.

5.5.6. Headache during pregnancy

Headache during pregnancy is a common complaint with myriad causes. More than the pain, over-the-counter medicines use for the headache may seriously affect the pregnancy outcome, particularly when they are taken during the first trimester.

Among widely available analgesics, paracetamol is the drug of choice for treatment of headache. Diclofenac, ibuprofen, indomethacin, and naproxen should not be given to pregnant women in the first and third trimester. Take note that untreated headache may cause depression and hypertension.

Also note that until proved otherwise, worsening of headache, headache not responding to simple analgesics, and new onset headache during pregnancy require thorough evaluation.

Key interventions:

5.5.6a. Investigate new onset of headache that is not responding to simple analgesics and is progressing, as it may be a symptom of an underlying serious disorder deserving thorough investigation or referral.

5.5.6b. Paracetamol is the drug of choice for treatment of headache during pregnancy.

5.5.7. Treatment of low-back pain, pelvic pain, and leg cramps

Low-back and pelvic pain are very common during pregnancy, even more common among women with a history of low-back pain in the previous pregnancy and in non-pregnant state. The lumbar lordosis to balance the growing uterus, increasing body-weight gain, and ligamentous laxity (relaxin, estrogen, progesterone effect) impact gravitational and mechanical load to the lumbosacral strain, can cause pain in some women.

In the management of low-back and pelvic pain during pregnancy, prevention through ergonomics (teaching the correct posture for standing, walking, bending and type of shoes) is recommended. There are several treatment options that can be used, such as physiotherapy and support belts, based on a woman's preference and available options.

Note: While exercise is helpful to relieve low-back pain, it could exacerbate pelvic pain associated with symphysis pubis dysfunction and is not recommended for this condition.

Leg cramps often occur at night and can be very painful, affecting sleep and daily activities. The potential etiology attributed to leg cramps is nutritional deficiency. Magnesium, calcium, or non-pharmacological treatment options can be used for the relief of leg cramps in pregnancy, based on a woman's preference and available options.

Wearing low-heeled shoes, sitting with the knee flexed and back straight with good support, avoiding weight-bearing activities and climbing stairs, and applying heat or massage to painful areas are also recommended.

Above all, the musculoskeletal pains are a diagnosis of exclusion; therefore, other serious disorder or infection should be excluded with meticulous evaluation before embarking on the diagnosis of pregnancy-related low-back or pelvic pain.

Key interventions:

5.5.7a. Reassure the pregnant women that low-back pain, joint pain, and abdominopelvic pain are temporary problems and can be soothed with non-pharmacological methods and simple analgesics.

5.5.7b. Create awareness of the risks of use of unverified over-the-counter medicines for minor pregnancy-related pains.

6. Health Systems Interventions to Improve the Utilization and Quality of Antenatal Care

Implementing evidence based health system interventions is needed to increase ANC service utilization, ensure equity and quality as well as an effective referral system, and improve clients' satisfaction. The health system is not limited to availing and sustaining the required resources and systems at the health facility level, but it includes community and program design, implementation, follow-up, and performance evaluation.

6.1. Introducing woman-held case notes

Pregnant woman attending ANC should be given their own case notes (home-based records) to carry during pregnancy. Women are expected to bring them to each ANC visits. If women move, or are referred from one facility to another, and in the case of complications where immediate access to medical records is not always possible, the practice of women-held case notes may improve the availability of women's medical records. Women-held case notes might also be an effective tool to improve health awareness and client–provider communication. Inadequate infrastructure and resources often hamper efficient recordkeeping; therefore, case notes may be less likely to get lost when held personally. In addition, the practice may facilitate more accurate estimation of gestational age, which is integral to evidence-based decision-making, due to improved continuity of fetal growth records. A separate A4 size, double-sided piece of card has been prepared to document summary findings and interventions at each ANC contacts (Annex 12).

6.2. Creating a woman-friendly environment

Pregnant women coming for ANC require a welcoming environment at health facilities in addition to the actual medical service. Reducing waiting time, arranging convenient time for service, flexible time for reception and culturally sensitive environment are useful to encourage women to initiate ANC and remain in follow-up. In rural areas, in particular, pregnant women like to use the opportunity of a market day for ANC service utilization.

Therefore, adjusting timing to the majority of pregnant women's preferences and at least ensuring ANC services 8-hours a day on all working days is a strategic decision health facilities need to undertake.

6.3. Pregnancy support during public health emergencies

Public health emergencies such as pandemics can affect provision of essential services. The recent COVID-19 pandemic resulted in disruption of essential services due to shortages of human resource, disruption of supply chain, overstretching health facilities, and reduced demand of services due to fear of infection. Evidence in West Africa during Ebola virus epidemic showed that the number of deaths due to measles, malaria, HIV/AIDS, Tb, and among mothers, infants, and newborns, attributed to health system failure, were much higher than those who died from Ebola virus. Hence**, it is important to ensure continuity of essential services including ANC for women during public health emergencies.** For ANC contacts, this can be ensured by extending dates of appointments for pregnant women who do not have danger signs and pregnancy-related problems, remote monitoring by phone as needed at the time of their regular appointment date, or HEWs can provide services for healthy pregnant mothers and can refer to the health facility for any problem, until the pandemic gets controlled. It is also important to ensure that pregnant women are protected from being infected and should be screened during their ANC follow-up.

6.4. Caring for women with special needs

Women with mental or physical disabilities, adolescents, survivors of gender-based violence, FGM, and women with physical disabilities have special needs and require care in addition to the core components of basic care. They may need help in communication, self-care, movement and decision making.

An important goal in caring for women with special needs during pregnancy is to determine whether their needs require specialized care/referral or whether the service provider can address them appropriately during the ANC contacts. It is the service provider's responsibility to ensure that all relevant information is made available to other providers in the same health facility or in another level of care if she is referred. This may include:

- Providing all information related to the special needs that have been identified.
- Counseling and making special recommendations about the woman's care during the antenatal, labor/birth, and postpartum periods; referral to specialized care; or supportive services as indicated.
- Facilitating linkages as appropriate with local sources of support (adolescent/youth corners, one-stop crisis center, social welfare, peer support groups, community service organizations, etc.). A key role of the health worker includes linking the health services with the community and other available support services. Maintaining existing links and, when possible, exploring needs and alternatives for support through community groups, women groups, leaders, peer support groups, other health service providers and community counselors.

6.4.1. Supporting pregnant women during humanitarian crisis

In humanitarian/emergency settings apart from providing shelter, nutrition, water, sanitation, and essential health care, including treatment of injuries to affected community, special attention must be paid to pregnant women and newborn babies, who are the most vulnerable in such circumstances. Pregnancy is a period of transition with important physical and emotional changes. Even in uncomplicated pregnancies, these changes can affect the quality of life for pregnant women, affecting both maternal and infant health. Hence, pregnant women are even more vulnerable during crisis situations and need to be provided with an appropriate support for safe pregnancy and delivery.

The assigned responsible health personnel in internally displaced people (IDP) sites should register pregnant women and remind them their appointment time and ensure follow-up by available personnel, including HEWs with available materials and counseling on nutrition and danger symptoms and signs. Moreover, additional rations of food, clean drinking water, and warm clothes to pregnant women should be availed. The register should include estimated date of delivery to facilitate referral or linkage to nearby health facility during onset of labor. Additionally, the responsible person in the IDP site should have ambulance address or contact for emergency referral. Information should be provided about availability of safe delivery and emergency obstetric and newborn care (EmONC) services and the need to seek care from facilities with a 24 hours per day, 7 days per week referral system to facilitate transport for delivery.

During humanitarian crisis, home delivery and unhygienic delivery is common, which potentially expose mothers and newborns to postpartum infections. To avert this, it is important to avail essential supplies at the IDP site in the form of kits such as clean delivery kits containing sterile supplies such as razors, plastic sheet, gloves, and other essential items to facilitate safe births, as well as "dignity kits" that contain hygiene materials such as sanitary napkins, underwear, soap and shampoo. Clean delivery kits have been a great help in decreasing incidences of infection for mothers and their babies if health facility delivery services are not available nearby. It is important to work with pregnant women on birth plans, including support for an evacuation plan in case of pregnancy or delivery related complications.

6.5. Digitizing the health system

Digitalizing the health system can increase the quality and utilization of ANC. Strengthening and expanding the ongoing momentum and piloting efforts to use electronic medical records to include secondary data sources (detailed medical records) can improve ANC and improve the health facility data documentation and ease of access for service and analysis. The electronic medical records will also be an advantage for establishing an electronic inter and intra-facility referral and feedback system.

6.6. Enhancing the capacity of ANC providers

To enhance the competence of health care providers, this guideline must be part of the trainings packages such as BEmONC, CEmONC, and Catchment Based Clinical Mentoring for Reproductive, Maternal, Newborn, Child, Adolescent and Youth Health Program as well as all relevant management protocols. Additionally, the guideline must be accessible to all providers and stakeholders in the form of hard copy, electronically, and uploaded on websites, such as the MoH and others. Furthermore, on-the-job training, mentorship and other relevant trainings such ultrasound trainings for middle level health care providers need to be strengthened as part of quality improvement efforts.

6.7. Integrating other RH services within the ANC package

ANC is a golden opportunity for women to get information and RH and non-RH services for themselves and their families. The ANC providers can use the opportunity to give an overview of the RH services that are available during and after the pregnancy (Annex 3).

6.8. Community engagement to increase ANC coverage

Community engagement is effective in promoting the quality of ANC services when the right strategies are used. Community engagement for ANC is mainly aimed to create demand for ANC, reduce dropout rates, promote service utilization, and enhance partner/male/ involvement. The approach includes strengthening/reactivating:

- Strengthening women development army
- Strengthening health extension program
- Applying community score card
- Regularly conducting pregnant women's conferences
- Pregnant women mapping and tracing
- Partner/male engagement in the continuum of care

Essentially, the future community mobilization initiatives have to be innovative, preferably technology-driven, and affordable.

6.9. Continuous quality improvement

Quality improvement (QI) is a continuous process whereby organizations iteratively test and measure changes in work routines, set and achieve ambitious aims, shift whole-system performance, and spread best practices for rapid uptake at a larger scale to address a specific issue or suite of issues they have determined to improve.

Continuous quality improvement (CQI) is one of the main means to achieve the intended goal of ANC—positive pregnancy experience. Poor quality of ANC could create a negative experience for a pregnant woman, which leads to poor demand and utilization of services. In addition, the quality of ANC service influences women's health care seeking behavior. Effective communication skills would

help to improve health care delivery. Receiving good quality ANC is an important factor to complete eight or more ANC contact. Hence, it is advised to continuously monitor the quality of ANC service to institute further improvements as required using a standardized tool (Annex 10).

ANC is expected to fulfill the principles of client satisfaction, scientific, and team approaches. Important considerations in QI of ANC service include:

- Ensure MCH head is member of the QI committee of the health facility
- Establish QI team at ANC or MCH department
- Use kaizen and model for improvement methods to improve ANC service
- Conduct clinical audit regularly using national clinical audit tool and design QI projects based on identified gaps (Annex 10 national clinical audit tool for hospital [HSTQ] and health center)
- Identify gaps and prioritize depending on the findings of HMIS, KPI, administratively tracked evidences and surveys
- Design QI projects, test, implement and monitor using appropriate quality measures based on the quality gap assessment.
- Select quality indicators for ANC, display using dashboard and monitor the selected indicators
- Participate and present QI projects on learning sessions and review meetings

The CQI assessment can be done at the facility or at the client's level. In this case, facility-based CQI assessment is crucial, as the health care provider can use the facility-based checklist to assess health professionals' performance against the minimum standard of ANC service, either as a team within the health facility or by an external team, to track the health services' progress.

6.10. ANC guideline implementation considerations

The major purpose of pre-service education and in-service training (basically, in the form of basic and comprehensive emergency obstetric and newborn care [BEmONC/CEmONC]) is to improve clinical evaluation and develop decision-making capacity in ancillary investigation and treatment plan. By updating this guideline for those who are on job and incorporating it into the pre service-curriculum, ANC programmers and service providers will be familiar with the ANC guideline. In due course, it will be fully implemented in the Ethiopian health system.

All stakeholders in RH service delivery should be committed and actively involved in fully implementing this guideline to achieve the expected outcomes. The roles and responsibilities of each stakeholder are stated below in Section 6.11.

Therefore, considerations in implementing the guideline include:

- Identifying and mobilizing all the required resources and stakeholders necessary to implement the guideline;
- Availing all the required infrastructure, drugs, equipment, supplies, and personnel
- Introducing and disseminating the guideline to all relevant health care providers and stakeholders at all levels through in-service trainings (on-site and off-site), workshops, and web-based platforms;
- Creating easy and continuous access to hard copy and soft copy of the guideline for all stakeholders involved in implementation of ANC;
- Ensuring appropriate implementation of ANC interventions at all service delivery points through a continuous quality improvement process.

6.11. Roles and responsibilities

6.11.1. Ministry of Health

- Disseminate ANC guideline, develop standardized job aids, and standard operating procedures that emphasize eight contacts in a health facility.
- Ensure coordination among responsible directorates and supporting the implementation of the guideline.
- Monitor the implementation status of ANC interventions through regular supportive supervision, review meeting, evidence generation and program evaluation.
- Update training materials and provide integrated refresher training as per the guideline.
- Mobilize resource for the implementation of ANC interventions.

6.11.2. Regional health bureaus, zonal health departments, and woreda health offices

- Coordinate and monitor the role of government organizations, non-governmental organizations, faith-based and community-based organizations, and private sector to implement the guideline.
- Cascade dissemination of guideline to stakeholders.
- Provide training of health care workers.
- Improve human resource, supplies, and equipment in health facility to provide quality ANC and increase uptake of ANC.
- Increase community engagement through available communication channels.
- Ensure coordination among responsible core processes/programs and coordinators to support health facilities in the implementation of the guideline.
- Monitor the implementation status of the guideline through regular supportive supervision and review meeting
- Coordinate and expand maternity waiting home
- Strengthen referral linkage from health post to health center, and from health center to a hospital.

6.11.3. Health facilities

- Ensure facility readiness and preparedness (facility set up with clean and well equipped facilities with uninterrupted supply of water and electricity, human resource, supplies, and equipment) to implement the guideline.
- Avail ANC guideline and relevant protocols, job aids, and information, education, and communication materials.
- Strengthen referral linkage with catchment health posts (health centers), and catchment health centers (hospitals).
- Coordinate community participation and engagement to strengthen the implementation of ANC guideline.
- Conduct regular clinical audit

6.11.4. Partners and professional associations

- Support financially and technically the government's efforts at all levels in disseminating and implementing the guideline.

- Coordinate their effort with government, non-governmental, faith-based and community-based organizations, and private sector to fully and effectively implement the all over the country.
- Participate actively in the CQI process
- Advocate for and conduct sensitization on ANC guideline.

6.11.5. Health care providers

- Ensure the provision of ANC as per the recommendation of the guideline.
- Update themselves regularly on the ANC guideline and related protocols.
- Ensure availability of the new guideline, relevant protocols, and job aids
- Ensure availability of adequate supplies and materials required to implement the ANC interventions in collaboration with their respective managers.
- Participate actively in community engagement for ANC.
- Ensure timely documentation and reporting of ANC service indicators.

6.11.6. Health post

The type and number of service packages and interventions to be delivered through the Health Extension Program (HEP) vary depending on the health post categories, i.e., comprehensive, basic, and integrated health posts.

Comprehensive health post

According to the list of HEP service packages and interventions by service delivery outlets on the Implementation Manual for Optimizing Health Extension Program, maternal health services related to ANC that are delivered at a comprehensive health post include promotion of early ANC, PMTCT, maternal nutrition, birth preparedness and complication readiness, danger signs, and maternal waiting home services. Human resource have been planned accordingly, until 2025, to include teams of different professions such as health officer, midwives, nurses, and Level 4 HEWs with availability of laboratory tests as described in detail in the implementation manual. Therefore, all components of new ANC guideline, in particular to eight contacts, will be provided at this category of health post if the basic conditions such as availability of lab services, aforementioned human resources, etc. are fulfilled.

Basic health post

Among the major packages and interventions outlined for basic health post, promotion of early ANC, maternal nutrition, birth preparedness, complication readiness, danger signs, maternity waiting services, skill delivery, and postpartum care are well addressed in the implementation manual for optimizing the HEP and will be delivered by two level-IV HEWs and a nurse or family health professional.

Likewise, the role of HEW in delivering ANC interventions at first ANC contact and at subsequent contacts in this category of health post is inconsistent across the eight contacts mainly due to unavailability of laboratory tests and imaging at this level. However, other components of ANC care (first contact and follow up contacts) such as past and current pregnancy history, current pregnancy follow-up, and routinely administered prophylaxis (except Anti-D for Rh negative) can be managed at

this category of health post. Besides, the essential laboratory tests and ultrasound scanning, particularly during the first contact and during the subsequent contacts, would need to be done by the catchment or supervisory health center, based on the existing referral system platform (Annex 11). Furthermore, HEW together with village health leaders (who are educated and at least above 6th grade) will actively participate in early identification of pregnant women and referring to the supervisory or catchment health center. Some of highlight activities that should be delivered by village health leaders include:

- Strengthen awareness creation to increase up take of early ANC through existing platform: women development army, men development groups, youth groups, and social structures.
- Conduct community mobilization about the importance of early ANC attendance and follow-up.
- Create awareness about danger sign occurring during pregnancy and refer to nearest health centers if encountered.
- Support the community in arranging available transportation of pregnant women to health centers.
- Collaborate with local administrator to strengthen maternity waiting home (both financial and in-kind).
- Facilitate and support regular pregnant women conference.

Merged health post

Merged HEP services are defined as HEP-essential packages that include health promotion, disease prevention services, to be provided in integration with health centers' routine health care services in the areas where health post is located within the compound of, or too close to, the health center or primary hospital. In this category of health post, promotion of early ANC, PMTCT, maternal nutrition, birth preparedness, complication readiness, counseling on danger signs, and maternity and waiting services are the main tasks of HEWs. However, routine ANC service delivery should be carried out in the health center that is merged with the health post.

6.12. ANC monitoring and evaluation

6.11.1. Documentation and reporting

Documentation and reporting provide the means to assess coverage, effectiveness, and quality of services delivered and promotes a culture of continuous quality improvement within the health system. Through effective monitoring and evaluation, program results at all levels can be measured to provide the basis for accountability and decision-making at both program and policy level.
There are different dimensions of data quality. To ensure appropriate targeting and planning, it is crucial that data are precise, complete, timely, reliable, and accurate.

All ANC information and findings should be documented in the ANC card in hardcopy or electronic record and ANC register. The task of filling each data entry should be designated to trained health staff in each antenatal clinic. At the end of each week, the supervisor should coordinate the completion of the ANC report and ensure that respective sections have made their submission in full and on time. The health facility supervisor is also responsible for ensuring the completeness of record entries and for monitoring the upkeep of the registers on a regular basis. The list of ANC indicators for M&E as well as their definition, frequency and source are included in Annex 13 and 14 respectively.

Key intervention:
6.1–6.5. a. Introduce woman-held case notes, create a welcoming health facility's environment, care for women with special needs, digitalize the health system to improve the quality and utilization of ANC
6.1-6.5. b. Avail all the required infrastructure, drugs, equipment, supplies, and personnel to implement ANC interventions
6.7a. Strengthen pre-service training, on-job training, mentorship, and supervision focusing on the interventions of this guideline.
6.8a. Introduce RH service integration into routine ANC to use the opportunity to address common RH problems of women
6.9a. Strengthen women development army, community-based joint forum, and family/partner engagement to increase public awareness and demand for ANC and delivery services
6.9–6.12. Instituting continuous quality improvement and improving documentation and reporting of ANC.

ANNEXES

Annex 1. Glossary

- **Antenatal care (ANC)** is a broad term to describe medical care provided by a skilled health care professional for pregnant women, aiming to make every pregnancy end with a healthy mother and baby and is positively experienced.
- **ANC coverage** is the proportion of pregnant women who received at least one ANC contact provided by skilled health personnel.
- **Routine ANC** applies to all pregnant women without specific pregnancy-related complications.
- **ANC 8** is the proportion of pregnant women who received at least eight ANC contacts provided by skilled health personnel.
- **Skilled health personnel** for ANC includes medical doctors, integrated emergency surgical officers, midwives, and nurses who are trained to provide medical services to pregnant and postpartum women as per the guideline and minimum standard of practice.
- **Effective ANC** is measured by the achievement of 1) preventing, detecting, and treating concurrent diseases and disorders; 2) linking to skilled health personnel-attended delivery; 3) ending preventable maternal and perinatal deaths; 4) ending near-miss cases; and 5) adherence to postpartum/postnatal counseling.
- **Quality ANC** provides safe, effective, timely, efficient, equitable, and pregnant woman-centered service and achieves a healthy mother, healthy baby, and a positive pregnancy experience.
- **Package of ANC** is summarized as: 1) provision of effective clinical services (diagnostic and therapeutic) to pregnancy and pregnancy-unrelated problems, 2) establishing effective communication and providing relevant and timely information to pregnant women and accompanier, and 3) providing psychosocial and emotional support when need arises.
- **Sub-optimally dated pregnancy** refers to the last normal menstrual period (LNMP)-based gestational age determination with no ultrasound confirmation before 24 weeks' gestation or ultrasound-based gestational age estimation after 24 weeks.
- **Woman-centered care** creates a comfort zone for pregnant women to let them freely communicate with ANC providers and have active participation in the decision-making process, by making the ANC service provision informative, supportive, individualized, and woman-centered at every contact. Woman-centered care is not about convincing a pregnant woman, but about encouraging and empowering her to make the right decision by allowing her privacy for examination, agreeing on psycho-sensitive investigations, adhering to treatment, continuing future follow-up, and making preparation for birth.
- **Three-steps of ANC consultation—**including introductory phase or opening the conversation, discussing pregnancy in detail (including history taking and physical examination), and providing basic information (counseling on danger symptoms, birth preparedness, complication readiness, companionship, integrating to other health issues as well as promoting self-care)—primarily are intended to ease and relax the pregnant woman, build her confidence, and end with key remarks.
- **Ensuring continuity of ANC service utilization** is an all-round effort to make sure that pregnant women will be regular clients until the end of pregnancy and are prepared for health facility delivery.
- **Creating a welcoming environment for ANC** during each contact requires easing access; showing respect and politeness; creating physical and psychological comfort while the pregnant woman is at the reception and in the examination, investigation, and counseling rooms.
- **Ensuring privacy and confidentiality for pregnant women**—avoiding exposing private parts of her body without her awareness and consent and assuring confidentiality.
- **Showing empathy and compassion** means being compassionate, respectful, and caring to build a pregnant woman's confidence and let her express her feelings and concerns.
- **Practicing respectful maternity care** is being compassionate, respectful, and caring to get full information and allow the woman to give informed consent ahead of the examination and procedure, decline any treatment or procedure, have privacy during examination/procedure, and freely express her views or ask questions.

Annex 2. Medical, Surgical, Psychiatric, and Obstetric Problems Requiring specialized ANC

Women with one or more of the following medical, surgical, or psychiatric disorders	Women with one or more of the following ob/gyn problems
• Chronic obstructive lung disease • Chronic hypertension • Cardiac disease • Chronic renal failure • Chronic hepatic disease • Diabetes mellitus • Thyroid dysfunction (hypo or hyperthyroidism) • Hematologic disorders • Epilepsy on treatment • Autoimmune disease • HBV or HCV infection • Severe psychiatric disorders • Malignancy • Obesity (BMI ≥30 kg/m2) • Surgical problem/scar • All severe anemia, mild to moderate anemia not responding to iron treatment	• Multiple pregnancy • Post-term pregnancy • Having a previous uterine scar • Decreased fetal movement/growth • History of or diagnosed to have: • Recurrent miscarriage, small-for-gestational-age or preterm birth, stillbirth, antepartum hemorrhage, prelabor rupture of fetal membranes • Gross congenital anomaly • Cerclage, LEEP, cone biopsy of cervix • Diagnosed to have severe pre-eclampsia/eclampsia • Rh sensitized • Placental accreta syndrome • Puerperal psychosis • Pelvic mass, extensive genital wart • Mullerian anomaly • FGM (Type III scar) • Transverse lie or breech at term • Suspected macrosomia or fetal growth restriction

Annex 3. Reproductive Health Services That Can Be Integrated into ANC

Gestational age in weeks	Possible RH services that can be integrated
1st contact	• Better to be specific to ANC proper; adding further assessment and provision may be overwhelming • PMTCT for HIV • Screening for nutrition
2nd contact (20 weeks)	• Preventing sexual and gender-based violence, discussing domestic violence • Screening for cervical cancer • Screening and treating reproductive tract infection and STI • Counseling on postpartum family planning to increase birth spacing and prevent unplanned pregnancy
3rd, 4th contacts (26–30 weeks)	Counseling on: • Completion of the Td vaccination for herself after birth and Expanded Programme on Immunization for her baby • FGM prevention and management if indicated • Prevention of child marriage and teenage pregnancy • Obstetric fistula symptoms and availability of treatment • Postpartum family planning
5th, 6th contacts (32–36 weeks)	Counseling on: • Postpartum family planning • Early initiation of breastfeeding within 1 hour after delivery and colostrum feeding • Exclusive breastfeeding for 6 months and total breastfeeding for 2 years, and avoiding pre-lacteal feeding

Annex 4. Key Activities in the Continuum of Maternity Care

Annex 5. Checklist for Counseling Danger Symptoms and Signs of Pregnancy During ANC

Clinical problem	Symptoms/signs	ANC contacts							
		1	2	3	4	5	6	7	8
Spontaneous abortion	Vaginal bleeding, lower abdominal pain								
Pre-eclampsia/ eclampsia	Throbbing and persistent headache								
	Blurring of vision								
	Epigastric or right upper quadrant abdominal pain								
	Petechial rash, swelling of fingers and face								
	Convulsion or coma for the first time								
PROM	leakage of fluid per vagina								
Antepartum hemorrhage	vaginal bleeding								
Gonococcal cervicitis	Foul smelling vaginal discharge								
Acute pyelonephritis	Flank pain, fever, dysuria, nausea and vomiting, may be hematuria								
Fetal growth restriction	No or little change in abdominal growth								
Fetal jeopardy	Decreased or absent fetal movement								
Others	Yellowish discoloration of eyes and skin								
	Persistent cough, fast or difficult breathing								
	Recurrent fainting								
	Fast abdominal girth increment								
	Unilateral leg swelling								

Shaded areas show the less probability of the occurrence of the specified health problem

Annex 6. Four Page ANC Card (baseline and follow-up sheet)

Name: _____Age: _____years; Telephone_____

1. Residence: 1. Urban 2. Rural
2. Occupation: 1. Employed 2. Unemployed
3. Marital status: 1. Married 2. Divorced 3. Widowed 4. Separated 5. Single
4. Gravida _____Para_____ Abortion _____Ectopic pregnancy_____GTD_____
5. LNMP____/_____/_____GA _____weeks; EDD____/___/_____. (First contact)
6. Gestational age from early ultrasound _____weeks (Date estimated: ___/___/_____)

Put a check mark for Yes (√) and X mark for No response (First contact)

Past pregnancy history	Yes	No	Note/Description
Did you have a history of:			
• spontaneous abortion?			
• induced abortion?			
• stillbirth?			
• congenital anomaly?			
• low birth weight (<2.5 kg)?			
• macrosomia (≥ 4kg)?			
• preterm birth?			
• early neonatal death?			
• leakage of fluid per vagina (PROM)?			
• vaginal bleeding after 7 months (antepartum hemorrhage)?			
• hypertensive disease?			
Did you deliver by cesarean section?			
Did you deliver by vacuum or forceps?			
Did you have another surgery on reproductive tract? (myomectomy, LEEP, Cerclage)			
Did you experience any other problem?			
Current pregnancy history			
Is this pregnancy planned?			
Are you from malaria endemic area?			
Are you diagnosed to have:			
• diabetes mellitus?			
• cardiac disease?			
• hypertension?			
• any other chronic illness?			
Do you have any question before proceeding?			

Date in Ethiopian calendar																
Gestational age in weeks																
Contacts	**1st**		**2nd**		**3rd**		**4th**		**5th**		**6th**		**7th**		**8th**	
Current pregnancy follow-up sheet	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
Is this pregnancy supported?																
Are you feeling fetal movement well?																
Is your abdominal growth good?																
Is your weight gain good?																
Do you have any medical problem this time?																
Do you use any substance or drug?																
Do you feel any pain or some other symptom?																
Is your husband accompanying you today?																
If yes, will you call him to come?																
May I request you to express your feeling?																
Do you have any more question I can answer?																
Blood pressure (systolic/diastolic)																
Mid-upper arm circumference (MUAC) in cm																
Body weight in kg/height in meter																
Palm and conjunctivae color (pink, pale)																
Symphysis fundal height																
Fetal heart beat (FHB) (+Ve/-Ve)																
Presentation (cephalic/breech/transverse lie)																

Laboratory tests, ultrasound scanning, and routine prophylaxis

Date in Ethiopian calendar								
Gestational age in weeks	**<12**	**20**	**26**	**30**	**34**	**36**	**38**	**40**
Contacts	**1st**	**2nd**	**3rd**	**4th**	**5th**	**6th**	**7th**	**8th**
Lab tests and imaging								
• Hemoglobin/hematocrit								
• Blood group and Rh								
• Urine analysis (dipstick for protein)								
• Urine gramstain								
• HIV								
• Syphilis								
• HBV								
• Obstetric ultrasound								
• OGTT (selected cases)								
Routinely administered prophylaxis:								
• Number of iron-folic acid (IFA) tabs supplemented								
• Number of IFA tabs consumed								
• Calcium								
• Td (at least 2–3 doses, 4 weeks interval)								
• Deworming after the first trimester								
• Anti-D for Rh negative and indirect Coomb's negative								

Summarizing the major findings and planning intervention in each contact

Date in Ethiopian calendar																
Gestational age in weeks																
Contacts	**1st**		**2nd**		**3rd**		**4th**		**5th**		**6th**		**7th**		**8th**	
	Yes	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
Hyperemesis gravidarum																
Anemia (Hb <11.5 gm/dl or Hct < 36%)																
Thinness (MUAC < 23 cm)																
Asymptomatic bacteriuria																
Recurrent urinary tract infection (UTI)																
HIV																
Syphilis																
Malaria																
Tuberculosis (Tb)																
Headache (H), Low-back pain (L)																
Hemorrhoid (H), Varicose veins (V)																
Constipation (C), Heartburn (H)																
Uterus size large (L) or small (S) for date																
Breech (B) or transverse lie (T) at term																
Counseling on lifestyle modification																
Counseling on danger symptoms																
Counseling on birth preparedness and complication readiness																
Counseling on optimal maternal nutrition																

Annex 7: The BMI Scale (to check pre-pregnancy BMI)

Height in centimeters	Weight in kilograms																		
	45	48	50	53	55	58	60	63	65	68	70	73	75	78	80	82.5	85	87.5	90
145	21.4	22.8	23.8	25.2	26.2	27.6	28.5	30.0	30.9	32.3	33.3	34.7	35.7	37.1	38.0	39.2	40.4	41.6	42.8
147	20.8	22.2	23.1	24.5	25.5	26.8	27.8	29.2	30.1	31.5	32.4	33.8	34.7	36.1	37.0	38.2	39.3	40.5	41.6
150	20.0	21.3	22.2	23.6	24.4	25.8	26.7	28.0	28.9	30.2	31.1	32.4	33.3	34.7	35.6	36.7	37.8	38.9	40.0
152.5	19.3	20.6	21.5	22.8	23.6	24.9	25.8	27.1	27.9	29.2	30.1	31.4	32.2	33.5	34.4	35.5	36.5	37.6	38.7
155	18.7	20.0	20.8	22.1	22.9	24.1	25.0	26.2	27.1	28.3	29.1	30.4	31.2	32.5	33.3	34.3	35.4	36.4	37.5
157.5	18.1	19.3	20.2	21.4	22.2	23.4	24.2	25.4	26.2	27.4	28.2	29.4	30.2	31.4	32.2	33.3	34.3	35.3	36.3
160	17.6	18.8	19.5	20.7	21.5	22.7	23.4	24.6	25.4	26.6	27.3	28.5	29.3	30.5	31.3	32.2	33.2	34.2	35.2
162.5	17.0	18.2	18.9	20.1	20.8	22.0	22.7	23.9	24.6	25.8	26.5	27.6	28.4	29.5	30.3	31.2	32.2	33.1	34.1
165	16.5	17.6	18.4	19.5	20.2	21.3	22.0	23.1	23.9	25.0	25.7	26.8	27.5	28.7	29.4	30.3	31.2	32.1	33.1
167.5	16.0	17.1	17.8	18.9	19.6	20.7	21.4	22.5	23.2	24.2	24.9	26.0	26.7	27.8	28.5	29.4	30.3	31.2	32.1
170	15.6	16.6	17.3	18.3	19.0	20.1	20.8	21.8	22.5	23.5	24.2	25.3	26.0	27.0	27.7	28.5	29.4	30.3	31.1
172.5	15.1	16.1	16.8	17.8	18.5	19.5	20.2	21.2	21.8	22.9	23.5	24.5	25.2	26.2	26.9	27.7	28.6	29.4	30.2
175	14.7	15.7	16.3	17.3	18.0	18.9	19.6	20.6	21.2	22.2	22.9	23.8	24.5	25.5	26.1	26.9	27.8	28.6	29.4
177.5	14.3	15.2	15.9	16.8	17.5	18.4	19.0	20.0	20.6	21.6	22.2	23.2	23.8	24.8	25.4	26.2	27.0	27.8	28.6
180	13.9	14.8	15.4	16.4	17.0	17.9	18.5	19.4	20.1	21.0	21.6	22.5	23.1	24.1	24.7	25.5	26.2	27.0	27.8
182.5	13.5	14.4	15.0	15.9	16.5	17.4	18.0	18.9	19.5	20.4	21.0	21.9	22.5	23.4	24.0	24.8	25.5	26.3	27.0
185	13.1	14.0	14.6	15.5	16.1	16.9	17.5	18.4	19.0	19.9	20.5	21.3	21.9	22.8	23.4	24.1	24.8	25.6	26.3
187.5	12.8	13.7	14.2	15.1	15.6	16.5	17.1	17.9	18.5	19.3	19.9	20.8	21.3	22.2	22.8	23.5	24.2	24.9	25.6
190	12.5	13.3	13.9	14.7	15.2	16.1	16.6	17.5	18.0	18.8	19.4	20.2	20.8	21.6	22.2	22.9	23.5	24.2	24.9

Annex 8. Common Macro and Micro Nutrient Sources

Nutrient type	Some of the best sources
Calorie	Grains (wheat, sorghum, corn, barley), dairy products (milk, cheese, butter), fruits, poultry (egg, chicken), fats and oils, sugar, honey, etc.
Protein	Beef, fish, chicken, eggs, milk, cheese, beans and peas, nuts, seeds, etc.
Iron	Red meat, liver, poultry, fish, dried beans and peas, iron-fortified cereals, etc.
Folate	Green leafy vegetables, orange, beans, liver, folic acid, etc.
Vitamin A	Carrots, sweet potatoes, green leafy vegetables, etc.
Iodine	iodized salt, sea/ocean food, dairy products, etc.
Zinc	Liver, kidney, red meat, poultry, fish, etc.

Annex 9. Principles of ANC

• Care for women with a normal pregnancy and birth should promote normal reproductive processes and women's inherent capabilities
• Pregnancy and birth should be viewed as a natural process in life and essential care should be provided to women with the minimum set of interventions necessary.
• Care should be based on the use of appropriate technology
• Sophisticated or complex technology should not be applied when simpler procedures may suffice or be superior.
• Care should be evidence-based
• Care should be supported by the best available research, and by randomized controlled trials where possible and appropriate.
• Care should be local
• Care should be available as close to the woman's home as possible and based on an efficient referral system
• Care should be multidisciplinary
• Effective care may involve contributions from a wide range of health professionals, including midwives, general practitioners, obstetricians, neonatologists, nurses, and childbirth and parenthood educators.
• Care should be holistic
• Care should include consideration of the intellectual, emotional, social, and cultural needs of women, their babies and families, and not only their physical care.
• Care should be woman-centered
• The focus of care should be meeting the needs of the woman and her baby. Each woman should negotiate the way that her partner and family or friends are involved. Care should be tailored to any special needs a woman may have.
• Care should be culturally appropriate and safe
• Care should consider and allow for cultural variations in meeting these expectations.
• Care should provide women with information and support so they can make decisions
• Women should be given evidence-based information that enables them to make decisions about care. This should be provided in a format that the woman finds acceptable and can understand.
• Care should respect the privacy, dignity, and confidentiality of women

Annex 10: AUDIT TOOL: ANC for Health Center

Facility name	
Audit topic	Clinical audit record for ANC
Objective	Ensure all pregnant women coming for ANC follow up receive appropriate care according to national guidelines
Period of Audit	
Exclusion criteria (where applicable)	
If all are completed give '1' if not give '0'	

S.N.	Measurement criteria	chart 1	chart 2	chart 3	chart 4	chart 5	chart 6	chart 7	chart 8	chart 9	chart10	chart11	chart12	chart13	chart14	chart15	chart16	chart17	chart18	chart19	Total
	Demographic and identification information recorded • Name • Age • Sex • Address • date of visit • MRN																				
	Present pregnancy, LMP, GA, Complaints including intimate partner violence																				
	Past obstetric history as per the national guideline, Integrated client card (ANC, Delivery and PNC) Medical History for DM, renal disease, cardiac disease, and chronic hypertension																				

S.N.	Measurement criteria	chart 1	chart 2	chart 3	chart 4	chart 5	chart 6	chart 7	chart 8	chart 9	chart10	chart11	chart12	chart13	chart14	chart15	chart16	chart17	chart18	chart19	Total
	Mental health problem																				
	substance use (drugs and other substance use such as alcohol, Khat, tobacco)																				
	Blood pressure taken at each visit																				
	Weight measured at each visit																				
	Fundal height every visit from 12 weeks																				
	Fetal heartbeat (Every visit from 20weeks)																				
	Fetal lie and presentation after 36 weeks																				
	Mid upper arm Circumference (MUAC < 23cm: except for TB, HIV and mothers on malnutrition treatment)																				
	Ultrasound before 24 weeks																				
	Essential laboratory tests were performed • Hemoglobin/hematocrit • Blood group and RH • VDRL/RPR • Urine for protein, microscopy • Rapid HIV test • HBsAg																				
	HIV viral load at first visit if HIV positive; On ART: 3 months, then 6 monthly																				
	Proper advice and counseling provided • Nutrition including iodine salt, calcium, and iron rich foods • Rest, hygiene, safe sex practice • Family planning • Breast feeding • partner HIV testing																				

S.N.	Measurement criteria	chart 1	chart 2	chart 3	chart 4	chart 5	chart 6	chart 7	chart 8	chart 9	chart10	chart11	chart12	chart13	chart14	chart15	chart16	chart17	chart18	chart19	Total
	• Birth Preparedness and complication readiness (Danger signs of pregnancy, place of birth, emergency fund and transport) • Provide HIV test result with posttest counseling • Safe sex practices and encouraged repeat testing after three months, if test result is negative.																				
	Advised on Malaria prevention, sleeping under an ITN																				
	Advised on Living positively, adherence to treatment, risk reduction, partner testing and exclusive breastfeeding if test result is positive																				
	Mother properly managed • Identified problems (mental health risk, HIV, malaria, preeclampsia, etc.) managed accordingly • Oral iron and folate supplemented according to the protocol • Deworming (single dose after 16 wks of gestation) • Scheduled a date for the next visit according to findings and recommended 8 antenatal visits • Birth plan developed.																				
	Td vaccine provided • If up to date, given 1 dose of tetanus vaccine at 27-36 weeks gestation • If not up to date/unknown, given 3 doses of tetanus vaccine: at first visit, then after 1 month and then after 6 months.																				
	Referred timely to hospital for specialized care if a woman experienced complications or problems																				
	Grade Total																				
	Average (%)																				

Annex 11. Woman-Held Case Note Template

Front Page

The FMoH, MCH Directorate, Maternal Health Services ANC Case Note Format.

Registration /No_____

I. Personal information

Name_____Aderss_____Date_____

Date of Birth (Age)_____ Height_____ Marital Status_____

Gravida_____ Family planning method use: Method_____

Parity_____ None_____ Abortion_____

II. Obstetrics and medical history:

Medical	Yes	No	Obstetrics	Yes	No
Anemia			Last normal menstrual period (Regular 28 days)		
Hypertension			Multiple Pregnancy		
Diabetes			CS (Uterine scar)		
TB			Previous bad pregnancy outcome. If yes, specify_____ _____		
Cardiac			EDD		

III. History of previous birth

Month/Y delivered	Duration of pregnancy		ANC		Delivery		Complications/ APH,PPH,CS etc.
	Full Term	Preterm	Yes	No	Type	Place	

Back page

IV. Current Pregnancy

Gestational age in weeks	1st (<12)	2nd 20	3rd 26	4th 30	5th 34	6th 36	7th 38	8th 40
Date of visit								
Blood group								
Rh factor								
HGB/HCT								
HBsAg								
Syphilis test								
Gestational/age								
Td vaccine								
Iron & folic acid								
Calcium sup								
Abnormal lab test								
Instituted treatment								
Remark								
Sign								

Annex 12: ANC Services by Level of Health Facility and Provider Category

Level of facility	Providers category	ANC service
Health post (comprehensive health post with lab facility)	Midwifes, Health officer, Nurse, health extension workers	• Perform ANC contacts for pregnant women with no identified problem • Take history (past pregnancy multi gravida and current pregnancy history) • Perform physical examination ○ Take vital sign, measure weight and height, measure MUAC, check for palm or conjunctiva (pink, pale), measure fundal height (after 18 weeks), check for fetal heartbeat, check for presentation • Administer prophylaxis: (IFA and deworming after first trimester) • Perform counseling on life style modification, danger signs and symptoms, birth preparedness and complication readiness and optimal maternal nutation • Coordinate pregnant women conference • Promote early ANC attendance • Strengthen referral linkage from health post to health center • Closely work with women development army • Identify and link pregnant women to health facilities

Health center	Midwifes, Health Officer, nurses, integrated emergency surgical officer(IESO), GP, laboratory professionals	• Perform 8 contacts as per the guideline
		• Take history (past pregnancy multi gravida and current pregnancy history)
		• Perform physical examination
		  ○ Take vital signs, measure weight and height, measure MUAC, check for palm or conjunctiva (pink, pale), measure fundal height (after 18 weeks), check for fetal heartbeat, check for presentation
		• Perform laboratory tests
		  ○ HGB/hematocrit
		  ○ Blood group and Rh
		  ○ Indirect Coomb's for Rh Positive pregnant women
		  ○ Urine analysis (dipstick for protein)
		  ○ Urine gram stain
		  ○ Test for HIV, syphilis, HBV
		  ○ OGTT

Level of facility	Providers category	ANC service
		• Perform obstetric U/S • Administer prophylaxis**:** (IFA, calcium, TD, deworming after first trimester and anti-D for RH negative and Indirect Coomb's negative for pregnant women) • Perform counseling on life style modification, danger signs and symptoms, birth preparedness and complication readiness and optimal maternal nutrition • Provide treatment for illness such as asymptomatic bacteriuria, UTI, malaria, HIV, syphilis, headache and others • Provide emergency care and refer for malpresentation
Hospital	OBGYN, IESO, midwives, HO, nurses, GP, medical radiology technologists, laboratory professionals, radiologists	In addition to health center services • Manage any pregnancy-related complications such as severe anemia, hypertension, DM, any bleeding related to pregnancy, severe infections and other chronic illness • Perform antepartum fetal surveillance • Follow and manage multiple pregnancy and hyperemesis

Annex 13. List of ANC Indicators with Definitions, Frequency, and Source (M&E)

Name of Program	Indicator	Numerator	Denominator	Frequency	Sources for monthly report
Maternal health (MH)	Antenatal coverage (at least one contact)	# of pregnant women attending ANC (new ANC)	Total number of expected pregnancy	Monthly	ANC register; HMIS
	Antenatal coverage (at least four contact)	# of pregnant women attending ANC at least four contacts	Total number of expected pregnancy	Monthly	ANC register; HMIS
	Percentage of women who received ANC at least 8 times	# of pregnant women attending ANC at least eight contacts	Total number of expected pregnancy	Monthly	ANC register; Form 1
	Proportion of pregnant women with anemia	The number of (new) registered pregnant women whose hemoglobin level was < 11g/dl	Total # of (new) pregnant women registered during the month	Monthly	ANC register
Nutrition	Proportion of pregnant women receiving IFA at least 90 + tabs	Number of pregnant woman who received IFA supplementation	Estimated # of pregnant woman	Monthly	ANC register
	Percentage of pregnant women receiving deworming drugs	# of pregnant women who received deworming	Estimated number of pregnant women	Monthly	ANC register
	Proportion of pregnant woman with MUAC <23 cm	# of pregnant women with acute malnutrition (MUAC <23 cm)	Estimated # of pregnant women	Monthly	HMIS
Expanded Program on Immunization (EPI)	Percent coverage of tetanus toxoid and diphtheria (second dose) in pregnant women	# of pregnant women who received immunization against tetanus and diphtheria for the second time	# of ANC attendant eligible for Td	Monthly	ANC register
PMTCT	Percentage of women who were tested and know their HIV status during pregnancy, labor or delivery and post-partum period	# of women who were tested and know their HIV status during pregnancy, labor or delivery and post-partum period	Estimated number of pregnant women	Monthly	• ANC Register
	Percentage of HIV-positive pregnant women who received ART to reduce the risk of mother-to child-	Number of HIV positive pregnant and lactating women who received ART at ANC, L&D and PNC for the	Estimated HIV positive pregnant women in the year	Monthly	• ANC Register

Name of Program	Indicator	Numerator	Denominator	Frequency	Sources for monthly report
	transmission during pregnancy, labor & delivery (L&D) and postpartum	first time and those women who get pregnant while on ART & linked to ANC			
	Percentage of pregnant women attending ANC whose male partners were tested for HIV during pregnancy	# of pregnant women attending ANC whose male partners were tested for HIV during pregnancy	# of pregnant women attending ANC	Monthly	• ANC register
	Proportion of pregnant women attending antenatal care tested for syphilis	Number of pregnant women tested for syphilis	Total number of pregnant women who attended first ANC contact	Monthly	DHIS2
	Proportion of syphilis-positive pregnant women who received syphilis treatment (eMTCT indicator)	# of syphilis -positive pregnant women who received antibiotics to reduce the risk of mother-to-child transmission	# of syphilis infected pregnant women	Monthly	PMTCT monthly report

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