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Maternal and Child
Survival Program

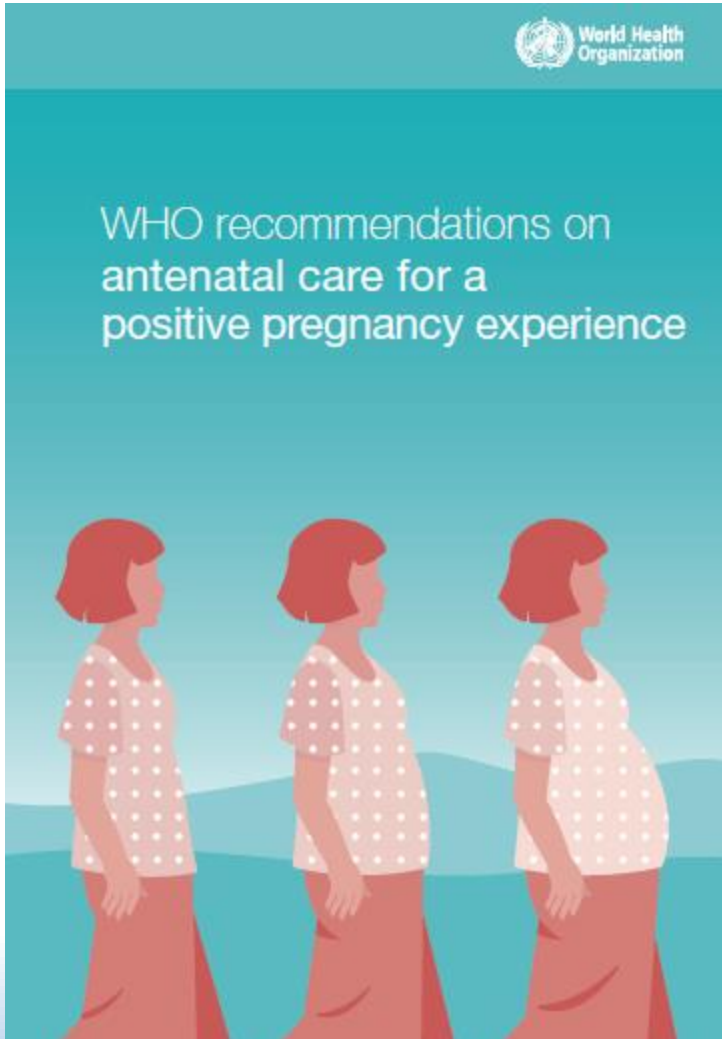


WHO recommendations on
antenatal care for a
positive pregnancy experience

A POSITIVE PREGNANCY EXPERIENCE

Highlights and considerations from the
*World Health Organization
recommendations on antenatal care for a
positive pregnancy experience (2016)*

**Expanded presentation for
MCSP country program staff**



Overview – Sections and Objectives

Part 1:

- Discuss process by which WHO ANC recommendations were developed
- Present selected highlights from the WHO 2016 ANC recommendations

Part 2:

- Hot topics and programmatic implications for implementation

Part 3:

- ANC-related updates in the WHO Managing Complications in Pregnancy and Childbirth manual, Second edition (MCPC 2nd edition, 2017)



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Part I:

Selected highlights from the WHO 2016 ANC
recommendations

Purpose of Recommendations

- Put women at the center of care
- Promote innovative, evidence-based approaches to antenatal care
- Enhance the woman's experience of pregnancy
- Ensure that babies have the best possible start in life
- Align with SDGs: expand care beyond survival
- Complement existing WHO guidelines on the management of specific pregnancy complications
- Promote a human rights-based approach to care

WHO Review Process

1. Identification of priority questions and outcomes
2. Evidence retrieval and synthesis
3. Assessment of the evidence (GRADE)
4. Formulation of the recommendations
5. Planning for implementation, dissemination, impact evaluation and updating of the guideline

Overall theme: Improving the experience of ANC



- Provide **effective communication** about physiological, biomedical, behavioral and sociocultural issues
- Provide **effective support**, including social, cultural, emotional and psychological support
- **Respectful care**
- **Person-centered health and well-being**

Results of review

- 5 categories were selected to review with 39 different recommendations
- Review questions focused on routine ANC care only
- However, many aspects of routine antenatal care were not reviewed
- This document is **NOT** a comprehensive guideline

A. Nutritional interventions

B. Maternal and fetal assessment

C. Preventive measures

D. Interventions for common physiological symptoms

E. Health system interventions to improve ANC utilization and quality

Results of review

- The first four areas (A-D) reviewed describe interventions that improve outcomes of pregnancy (the “what” of ANC)
- The fifth area describes interventions that improve quality and uptake of best practices of care (the “how” of ANC)

A. Nutritional interventions

B. Maternal and fetal assessment

C. Preventive measures

D. Interventions for common physiological symptoms

E. Health system interventions to improve ANC utilization and quality

Results of review

- Each area of review contains:

Identified in this presentation by:

- Universal recommendations (for all countries) →
- Recommendations for specific contexts
- Recommendations for specific contexts in research
- Practices not recommended

All ANC settings

Context-specific

A. Nutritional interventions



All ANC settings: Nutrition

Daily oral IFA with 30 to 60 mg of elemental iron and 400 μg (0.4 mg) of folic acid

Recommendation A.2.1



Provide counseling about healthy eating and keeping physically active to stay healthy and prevent excessive weight gain during pregnancy

Recommendation A.I.1



- Universal recommendation: Consider culturally appropriate healthy eating and exercise interventions
- Weight gain (status at start of pregnancy):
 - underweight (BMI < 18.5)= 12.5–18 kg
 - normal weight (BMI 18.5–24.9 kg/m²)= 11.5–16 kg
 - overweight (BMI 25–29.9)= 7–11.5 kg
 - obese women (BMI > 30)= 5–9 kg

Context-specific: Nutrition

Women intolerant of IFA side effects:

Intermittent oral IFA with 120 mg of elemental iron and 2800 μ g (2.8 mg) of folic acid once weekly

Recommendation A.2.2

Populations with low dietary calcium intake:

Daily calcium supplementation (1.5–2.0 g oral elemental calcium) to reduce risk of pre-eclampsia

Recommendation A.3



Areas where vitamin A deficiency is a severe public health problem:

Vitamin A supplementation for pregnant women to prevent night blindness

Recommendation A.4



- Not recommended as a means of improving maternal and perinatal outcomes per se but rather as prevention of night blindness
- Dose: daily up to 10 000 IU vitamin A or Weekly of up to 25 000 IU

Context-specific: Nutrition

A.1.2: In undernourished populations, nutrition education on increasing daily energy and protein intake is recommended for pregnant women to reduce the risk of low-birth-weight neonates.	Context-specific recommendation
A.1.3: In undernourished populations, balanced energy and protein dietary supplementation is recommended for pregnant women to reduce the risk of stillbirths and small-for-gestational-age neonates.	Context-specific recommendation
A.5: Zinc supplementation for pregnant women is only recommended in the context of rigorous research.	Context-specific recommendation (research)
A.10: For pregnant women with high daily caffeine intake (more than 300 mg per day), lowering daily caffeine intake during pregnancy is recommended to reduce the risk of pregnancy loss and low-birth-weight neonates.	Context-specific recommendation

A.1.4: In undernourished populations, high-protein supplementation is not recommended for pregnant women to improve maternal and perinatal outcomes.	Not recommended
A.6: Multiple micronutrient supplementation is not recommended for pregnant women to improve maternal and perinatal outcomes.	Not recommended
A.7: Vitamin B6 (pyridoxine) supplementation is not recommended for pregnant women to improve maternal and perinatal outcomes.	Not recommended
A.8: Vitamin E and C supplementation is not recommended for pregnant women to improve maternal and perinatal outcomes.	Not recommended
A.9: Vitamin D supplementation is not recommended for pregnant women to improve maternal and perinatal outcomes.	Not recommended

B. Maternal and fetal assessment



All ANC settings: Maternal/fetal assessment

One ultrasound scan before 24 weeks is recommended to estimate gestational age, improve detection of fetal anomalies and multiple pregnancies, reduce induction of labour for post-term pregnancy, and improve a woman's pregnancy experience

Recommendation B.2.4



Considerations

- U/S recommended early (<24 weeks)
 - Additional scans later in pregnancy not recommended
- Effects of introducing antenatal ultrasound in rural, low-resource settings are unproven on population health outcomes and health systems



All ANC settings: Maternal/fetal assessment

Classify hyperglycemia first detected at any time during pregnancy as either gestational diabetes mellitus (GDM) or diabetes mellitus in pregnancy, according to WHO criteria

Recommendation B.1.4



- No recommendation for routine screening for diabetes in pregnancy

All ANC settings: Maternal/fetal assessment



Recommendation B.1.7

In high-prevalence settings:

Implement provider-initiated testing and counselling (PITC) for HIV in all ANC settings

In low-prevalence settings:

PITC can be a key component in ANC to:

- **eliminate mother-to-child transmission of HIV, and**
- **integrate HIV testing with syphilis, viral or other key tests**

Recommendation B.1.7

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

All ANC settings: Maternal/fetal assessment

<p>B.1.5: Health-care providers should ask all pregnant women about their tobacco use (past and present) and exposure to second-hand smoke as early as possible in the pregnancy and at every antenatal care visit.</p>	<p>Recommended</p>
<p>B.1.6: Health-care providers should ask all pregnant women about their use of alcohol and other substances (past and present) as early as possible in the pregnancy and at every antenatal care visit.</p>	<p>Recommended</p>

Context-specific: Maternal/fetal assessment

Where abdominal palpation is used to assess fetal growth:

Not recommended to change to symphysis-fundal height (SFH) measurement

Recommendation B.2.2

Daily fetal movement:

Daily fetal movement counting, such as with “count-to-ten” kick charts, not recommended (only in the context of rigorous research)

Recommendation B.2.1



Context-specific: Maternal/fetal assessment

Where full blood count testing is not available for anemia testing:

On-site Hb testing with a haemoglobinometer is recommended (over the Hb color scale)

Recommendation B.1.1



Where urine culture is not available for ASB diagnosis:

On-site midstream urine gram stain is recommended (over dipstick tests)

Recommendation B.1.2

Context-specific: Maternal/fetal assessment

Where TB prevalence is high ($\geq 100/100,000$):

Consider symptomatic screening for active TB in ANC

Recommendation B.1.8

Clinical enquiry about the possibility of intimate partner violence (IPV) should be strongly considered at antenatal care visits when assessing conditions that may be caused or complicated by IPV in order to improve clinical diagnosis and subsequent care, where there is the capacity to provide a supportive response (including referral where appropriate) and where the WHO minimum requirements are met.

Recommendation B.1.3

B.2.3: Routine antenatal cardiotocography is not recommended for pregnant women to improve maternal and perinatal outcomes.	Not recommended
B.2.5: Routine Doppler ultrasound examination is not recommended for pregnant women to improve maternal and perinatal outcomes.	Not recommended

C. Preventive measures



All ANC settings: Preventive measures

A seven-day antibiotic regimen is recommended for all pregnant women with asymptomatic bacteriuria (ASB)

Recommendation C.1



All ANC settings: Preventive measures

Tetanus toxoid vaccination is recommended for all pregnant women, depending on previous tetanus vaccination exposure

Recommendation C.2



Context-specific: Preventive measures

In malaria-endemic areas in Africa:

Start intermittent preventive treatment with sulfadoxine-pyrimethamine (IPTp-SP) in the second trimester. Give at least 3 doses, each one month apart

Recommendation C.6



- IPTp can continue to start as early as possible in the second trimester (13 weeks). Repeat doses should occur each month with a total not to exceed 7 doses.

Context-specific: Preventive measures

For pregnant women at substantial risk of acquiring HIV infection*:

Offer oral pre-exposure prophylaxis (PrEP) containing tenofovir disoproxil fumarate (TDF)

Recommendation C.7



- Integrated from WHO guideline on when to start ARV therapy on PrEP for HIV (2015)
- Substantial risk = incidence $> 3\%$ per 100 person-years

Context-specific: Preventive measures

C.2: Antibiotic prophylaxis is only recommended to prevent recurrent urinary tract infections in pregnant women in the context of rigorous research.	Context-specific recommendation (research)
C.3: Antenatal prophylaxis with anti-D immunoglobulin in non-sensitized Rh-negative pregnant women at 28 and 34 weeks of gestation to prevent RhD alloimmunization is only recommended in the context of rigorous research.	Context-specific recommendation (research)
C.4: In endemic areas, preventive anthelmintic treatment is recommended for pregnant women after the first trimester as part of worm infection reduction programmes.	Context-specific recommendation

**D. Interventions for
common
physiological
symptoms**



Symptom	Recommendation
Nausea and vomiting	Ginger, chamomile, vitamin B6, and/or acupuncture for relief of nausea in early pregnancy.
Heartburn	Advice on diet and lifestyle to prevent and relieve heartburn in pregnancy. Antacid preparations for women with troublesome symptoms not relieved by lifestyle changes.
Leg cramps	Magnesium, calcium, or non-pharmacological treatment options for relief of leg cramps in pregnancy.
Low back/ pelvic pain	Regular exercise throughout pregnancy to prevent low back and pelvic pain. Different treatment options can be used, such as physiotherapy, support belts, and acupuncture.
Constipation	Fiber supplements to relieve constipation in pregnancy if the condition fails to respond to dietary modification.
Varicose veins and edema	Non-pharmacological options, such as compression stockings, leg elevation, and water immersion, for management of varicose veins and edema in pregnancy.
*In general, these interventions should be adopted and adapted, based on women's preferences and available options.	

E. Health system interventions to improve ANC utilization and quality



A minimum of eight ANC contacts are recommended to reduce perinatal mortality and improve women's experience of care

Recommendation E.7



Throughout pregnancy, all women should have 8 contacts with a health provider.

These can happen in settings such as:



Health systems should ensure that all providers are empowered and equipped with necessary skills and supplies.

ANC contacts schedule

- Four visits not enough:
 - Inadequate contact with health care providers
 - Less maternal satisfaction with care
 - More perinatal deaths
- Minimum 8 contacts improves quality:
 - Focus on timely detection of risk factors and complications
 - More contact between pregnant women and knowledgeable, respectful, supportive providers more likely to lead to positive pregnancy experience

Box 5: Comparing ANC schedules

WHO FANC model	2016 WHO ANC model
<i>First trimester</i>	
Visit 1: 8-12 weeks	Contact 1: up to 12 weeks
<i>Second trimester</i>	
Visit 2: 24-26 weeks	Contact 2: 20 weeks Contact 3: 26 weeks
<i>Third trimester</i>	
Visit 3: 32 weeks	Contact 4: 30 weeks Contact 5: 34 weeks
Visit 4: 36-38 weeks	Contact 6: 36 weeks Contact 7: 38 weeks Contact 8: 40 weeks
Return for delivery at 41 weeks if not given birth.	

All ANC settings: Health systems

<p>E.1: It is recommended that each pregnant woman carries her own case notes during pregnancy to improve continuity, quality of care and her pregnancy experience.</p>	Recommended
<p>E.5.1: Task shifting the promotion of health-related behaviors for maternal and newborn health to a broad range of cadres, including lay health workers, auxiliary nurses, nurses, midwives and doctors is recommended.</p>	Recommended
<p>E.5.2: Task shifting the distribution of recommended nutritional supplements and intermittent preventative treatment in pregnancy (IPTp) for malaria prevention to a broad range of cadres, including auxiliary nurses, nurses, midwives and doctors is recommended.</p>	Recommended

In settings with well functioning midwifery programs:

Midwife-led continuity-of-care models—in which a known midwife or small group of known midwives supports a woman throughout the antenatal, intrapartum and postnatal continuum—are recommended

Recommendation E.2



Context-specific: Health systems

<p>E.3: Group antenatal care provided by qualified health-care professionals may be offered as an alternative to individual antenatal care for pregnant women in the context of rigorous research, depending on a woman's preferences and provided that the infrastructure and resources for delivery of group antenatal care are available.</p>	<p>Context-specific recommendation (research)</p>
<p>E.4.1: The implementation of community mobilization through facilitated participatory learning and action (PLA) cycles with women's groups is recommended to improve maternal and newborn health, particularly in rural settings with low access to health services. Participatory women's groups represent an opportunity for women to discuss their needs during pregnancy, including barriers to reaching care, and to increase support to pregnant women.</p>	<p>Context-specific recommendation</p>
<p>E.4.2: Packages of interventions that include household and community mobilization and antenatal home visits are recommended to improve antenatal care utilization and perinatal health outcomes, particularly in rural settings with low access to health services.</p>	<p>Context-specific recommendation</p>
<p>E.6: Policy-makers should consider educational, regulatory, financial, and personal and professional support interventions to recruit and retain qualified health workers in rural and remote areas.</p>	<p>Context-specific recommendation</p>



**“A woman’s
experience of care is
key to transforming
antenatal care and
creating thriving
families and
communities.”**



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Part 2:

Hot Topics for MCSP Country Program Staff

Technical/clinical considerations

Implications for MCSP Programs: Hot Topics

1. Recommended **8 antenatal contacts**
 - WHO specifically states these do not all have to take place in a facility
2. Routine **ultrasound** before 24 weeks
3. **IPTp** treatment schedules
4. Approach to detecting and/or diagnosing gestational **diabetes** or pre-existing diabetes
5. **Asymptomatic bacteriuria** screening and treatment

Figure 1. 2016 WHO ANC Model (recommended)



*The 2016 ANC Model includes “contacts” rather than “visits” to indicate that health systems may use alternatives to traditional facility-based, individual ANC visits. Compared to the previous FANC Model, the 2016 ANC Model recommends more frequent contacts between ANC providers and pregnant women in the third trimester of pregnancy.

**Intermittent preventive treatment of malaria in pregnancy (IPTp) should be started at ≥13 weeks.

- Note change from “visit” to “contact”
- Operationalize in the local context
- More frequent contacts in the third trimester—aimed at preventing stillbirths based on evidence

Hot topic #1: 8 ANC contacts

Evidence

- Increased perinatal deaths in 4-visit ANC model
- Need for increased frequency of maternal and fetal assessment to detect complications—particularly later in pregnancy
- More “contacts” with respectful, knowledgeable health care workers → more likely to lead to a positive pregnancy experience
- No added benefit in terms of outcomes of 11–15 contacts (HIC studies)

Implementation

- Resources: budgets, commodities, lab, staff time
- Logistics and organization of service delivery
- Increased cost for women: travel, waiting time, fees, labs
- Infrastructure
- Facility vs. community outreach services contacts: Task shifting; continuity of care

#1. 8 ANC contacts: MCSP Priorities

Maximize quality of every current contact

- Focus on **priority intervention packages** by phase of pregnancy, not limited to WHO recs
 - Complication identification including risk detection
- Emphasize *respectful, individualized, person-centred care* at every contact: respectful maternity care (RMC), communication & support
- Improve coverage and quality for interventions addressing high-burden conditions in pregnancy in Africa (e.g., malaria, HIV, TB)

Support frontline teams to implement the packages and track priority measures as part of ongoing QI

- Standardized records
- Health worker data competencies
- Regular use of ANC results to strengthen services

WHO ANC Recommendations Already Prioritized in MCSP Countries

Routine	Contextual
IFA	Provider-initiated HITC
Nutritional counseling	IPT _p -SP
Tetanus toxoid	De-worming
Woman-carried case notes	IPV screening in settings with capacity for followup (Rwanda)
Task-shifting (targeted)	TB screening
	Midwifery-led models of care
	Hgb/FeSO ₄ for anemia

Hot topic #2: Routine ultrasound

Evidence

- Not proven to reduce perinatal mortality
- First Look Study—results pending
- May reduce induction of labor (IOL) for post-term pregnancy
- May decrease maternal concern about pregnancy
- May increase detection of congenital anomalies
- Probably has little effect on small for gestational age (SGA)

Implementation

- Budgeting
- Logistics
- Infrastructure
- Task shifting
- Must monitor impact on health outcomes, facility utilization and equity

#2. Routine ultrasound: Considerations

NEED TO HAVE	NEED TO KNOW
<p><u>Facility Level:</u></p> <ul style="list-style-type: none"> • Ultrasound machine, transducers, and gel • Space, security, environmental protection for equipment • Power surge protection, back-up power supply <p><u>Health System Level:</u></p> <ul style="list-style-type: none"> • Mechanism to share reports between facilities • Pre-service and/or in-service training with concurrent establishment of regulatory standards for education, training, and on-going competencies 	<p><u>Provider Level:</u></p> <ul style="list-style-type: none"> • Regulations around ultrasound use • How to perform or refer for obstetric ultrasound • How to interpret results and counsel women <p><u>Health System Level:</u></p> <ul style="list-style-type: none"> • Capacity of ultrasound providers to act as providers and trainers/mentors • Current geographic distribution of functional machines, service providers, and maintenance providers
NEED TO DO	NEED TO CONSIDER
<p><u>Provider Level:</u></p> <ul style="list-style-type: none"> • Conduct/refer for obstetric ultrasound, document results • Update GA and EDD using evidence-based guidelines <p><u>Health System Level:</u></p> <ul style="list-style-type: none"> • Determine appropriate settings and timeline for introduction of ultrasound • Obtain machines • Capacity-building plan 	<ul style="list-style-type: none"> • Costs: of purchase, maintenance, training, impact of shifting resources to U/S from other key costs, and environmental control to protect equipment from failure • Availability of service contracts to support machine maintenance, especially in areas not previously prioritized for ultrasound market development • Protection from power surges and warm temperatures, which can permanently damage machines • Extreme fragility of ultrasound transducers

Hot topic #3: IPTp treatment schedules

- Recommendation is to begin treatment as early in second trimester as possible, e.g., 13 weeks
- Two considerations:
 1. Recommended initiation of care is <12 weeks. Feasibility of two visits in short span of time not clear
 2. Dating often very unclear in lower-resource settings

Figure 1. 2016 WHO ANC Model (recommended)



Hot topic #4: Gestational diabetes mellitus

- Routine testing for GDM not in recommendations though GDM has significant health implications for both mother and baby
- Cost-effectiveness of different screening strategies not clear
 - Urine dipsticks' accuracy questionable
 - Blood draws resource intensive
- Will have to be determined within country context based on prevalence and feasibility

Hot topic #5: Asymptomatic Bacteriuria (ASB)

- ASB is associated with an increased risk of preterm birth though evidence is low certainty.
- Midstream urine culture is gold standard of diagnosis; gram stain and urine dipstick can be utilized though with much lower sensitivity and specificity
- Gold standard difficult to achieve in lower-resource settings
- High level of accuracy in detecting ASB important to avoid over-treating

Hot topic #5: Asymptomatic Bacteriuria (ASB)

- GBS bacteriuria associated with heavy GBS colonization, thus increasing the risk of an infant with early onset GBS infection
- Priority research topic, given association with PTB and uncertainty around urine testing and treatment, in order to understand health outcomes and feasibility, coupled with accuracy, of on-site testing.
- Need to understand prevalence in order to determine universal vs. targeted testing

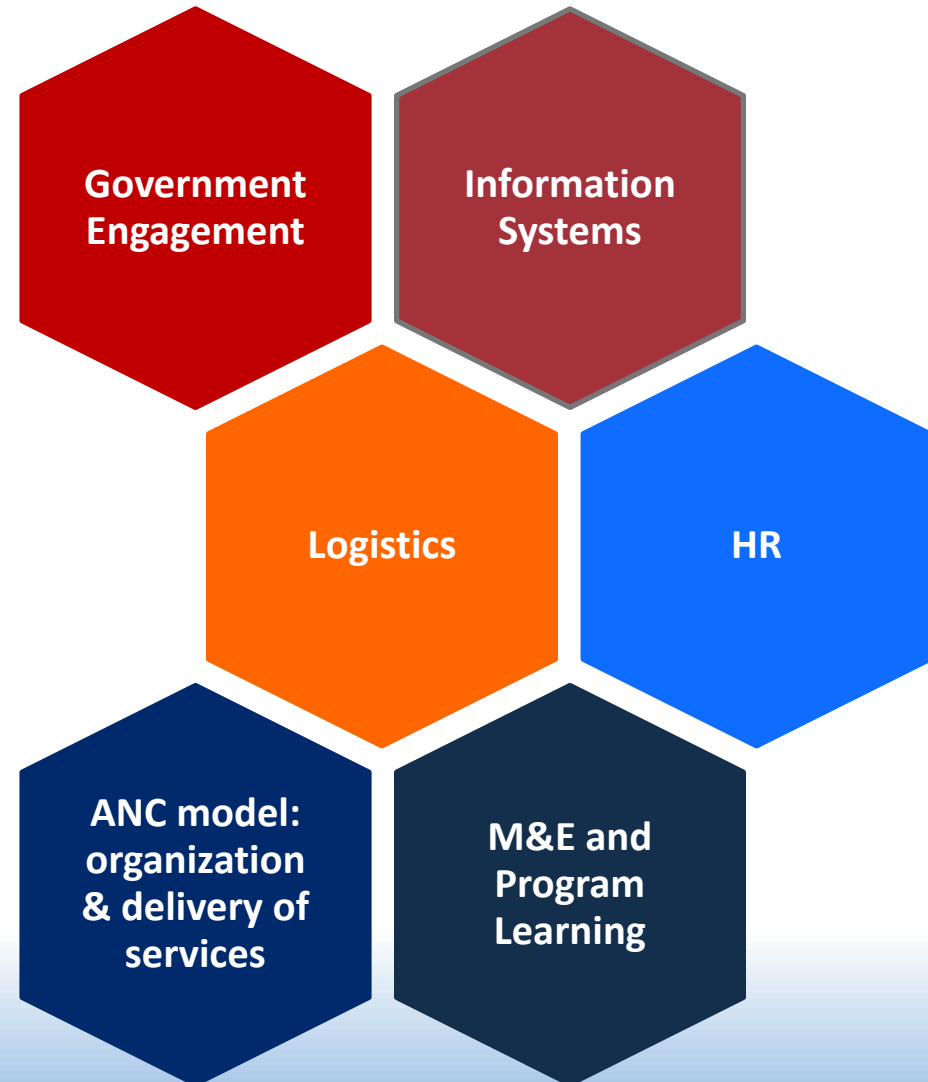


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Part 3: Programmatic Considerations

Considerations for in-country
implementation of WHO ANC
recommendations



Program Implications: Governance and engagement of key actors across system levels

- Effective implementation of recommendations will require leadership and engagement of key actors across levels of the health system, such as:
 - national policy makers, regional/district Ministry of Health (MOH) managers, facility managers, facility HCWs, community leaders and health agents and women and families.
- Ideally, a country's ANC roadmap will include a specific plan for engaging private sector health care workers.
- Community and women's representatives can help advocate for the inclusion of women's and families' needs and preferences into the design and implementation of an updated country ANC model.

Program Implications: Information Systems

- Review and update ANC indicators for incorporation into routine HMIS for use by key actors and stakeholders
- Review and update (or introduce) standardized ANC registers, client-held notes and other needed data tools to track prioritized ANC data (all system levels and contact sites)

Program Implications: Commodities and logistical support

- Plan for procurement, distribution and financing of new ANC commodities.
- Strengthen logistics systems for essential ANC commodities.
- Ensure 24/7 availability of essential commodities and ANC records and registers (all contact sites).

Program Implications: HR Support

- Review and update the practice scope of ANC provider cadres including regulation, licensing and continuing professional development mechanisms (e.g. nurses, midwives, auxiliary health workers, community health workers, doctors).
- Strengthen midwifery deployment, training, supportive supervision and ongoing professional support.
- Develop ANC task-shifting plan including use of lay workers, CHWs and auxiliary nurses to promote health related behaviours and distribution of key commodities (e.g. IPTp, recommended nutritional supplements.)

Program Implications: HR Support

- Collaborate with educational institutions and government to develop competency-based training curricula focused on acquisition of person-centred ANC skills for implementation of the ANC recommendations.
- Review and update pre- and in-service ANC training, educational and supervision strategies and ANC-specific materials/job aids.
- Explore innovative capacity-building approaches to sustain delivery of high-quality ANC care in line with WHO recommendations.
- Develop/update patient communication and counselling materials for promotion of healthy behaviours.

Program Implications: ANC model – organization and delivery of ANC contacts

- Develop a sustainable ANC service delivery model for the country context that defines *how* services will be organized to deliver a core ANC services package, including *which* interventions will be provided at each contact and by *whom* (cadre), *where* (system level) and *how* (platform).
- Define mechanisms to ensure coordination of care across ANC contact points including community- to-facility linkages and supportive oversight of community-based services, activities and auxiliary health workers.

Program Implications: ANC model – organization and delivery of ANC contacts

- Support reorganization of ANC services and/or client flow as needed to reduce wait times and improve efficiency of service delivery and satisfaction of clients and providers.
- Support activities to improve ANC quality, including support to teams and health workers to identify and overcome key health system and local service delivery barriers to deliver evidence-based respectful ANC and to track a small number of ANC quality of care process and outcome indicators to monitor quality and women's experience of pregnancy care.

Program Implications: M&E and Programme Learning

- Strengthen collection and use of a minimum set of ANC data, prioritized for specific actors, to support clinical decision-making, programme management, quality improvement, and surveillance aimed at improving ANC and maternal and perinatal outcomes.
- Define implementation milestones for the costed ANC roadmap and monitor milestones to strengthen implementation and inform continuous learning.
- Support implementation research to inform introduction and scale up of new and/or complex ANC interventions or interventions recommended as part of research.

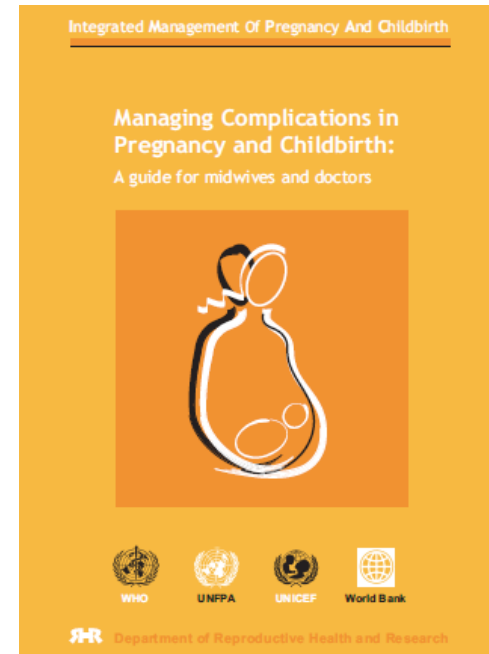


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Part 3: ANC-relevant Content from the WHO Managing Complications in Pregnancy and Childbirth manual, Second edition (MCPC, 2017)

- PE/E and hypertension
- Infection



PE/E Updates for ANC

- Revised classification framework
- Prevention of PE/E
 - Calcium supplementation
 - Low-dose aspirin
- Use of BP in diagnosing and managing PE/severe PE
- Use of laboratory findings for severe PE
- Use of antihypertensive in management of HTN and acute severe systolic HTN

PE/E: Revised Classification Framework

- Chronic hypertension (elevation of BP < 20 weeks gestation or persisting > 12 weeks postpartum)
- Gestational hypertension
- Mild pre-eclampsia
- Severe pre-eclampsia
- Eclampsia
- Chronic hypertension with superimposed pre-eclampsia

PE/E: Prevention

- **Calcium supplementation** (in areas with low dietary intake)
 - 1.5–2.0 g elemental calcium/day
 - All women, but particularly those at high-risk of PE*
- **Low-dose (75 mg) acetylsalicylic acid (aspirin)**
 - Initiated 12–20 weeks of gestation for women at high risk of PE*



***At High Risk of Developing PE**=Previous severe PE/E, diabetes, chronic hypertension, obesity, renal disease, autoimmune disease and multiple pregnancies.

Clinical Criteria for Diagnosis of HTN in Pregnancy

- **SBP \geq 140 mm Hg** and/or **DBP \geq 90 mm Hg** (2 consecutive readings 4 hours or more apart) with \geq 2+ proteinuria
- **Severe SBP \geq 160** and /or **DBP \geq 110 mm Hg** with \geq 2+ proteinuria

Mild PE: Diagnosis and Guidance for Monitoring and Timing of Delivery

Diagnosis of (Mild) Pre-Eclampsia

- **New onset hypertension and proteinuria after 20 weeks gestation:**
 - SBP \geq 140 and/or DBP \geq 90 after 20 weeks of gestation
 - Proteinuria 2+ on dipstick
- Pre-eclampsia **without** any severe features present (please refer to severe features below, including neurologic, pulmonary, hepatic, renal, hematologic, in "Diagnosis of severe pre-eclampsia").

Summary Guidance for Monitoring and Timing of Delivery for (Mild) Pre-Eclampsia

- **Gestational age < 37 + 0/7 weeks**
 - As long as mother and fetal well-being remains stable, goal is for woman to reach 37 + 0/7 weeks.
 - However, **remain vigilant:** pre-eclampsia may rapidly progress to severe pre-eclampsia.
 - **Close monitoring** and high suspicion for worsening includes monitoring for danger signs, BP and fetal condition (though ongoing monitoring of proteinuria and additional periods of rest are no longer recommended).
 - **Outpatient care:** If BP and signs of pre-eclampsia remain unchanged or normalized, follow-up twice per week
 - If outpatient follow-up is not possible, admit woman for close monitoring, including BP (4-6x daily)
- **Gestational age \geq 37 + 0/7 weeks**
 - Induction of labor/delivery

Severe PE: Diagnosis and Guidance for Timing of Delivery

Diagnosis of Severe Pre-Eclampsia

- **New onset hypertension and proteinuria after 20 weeks gestation:**
 - > SBP ≥ 160 and/or DBP ≥ 110 after 20 weeks of gestation
 - > Proteinuria 2+ on dipstick
- **Pre-eclampsia with any of the following present, diagnose severe pre-eclampsia:**
 - > **Neurologic:** Headache, vision changes, hyper-reflexia, clonus
 - > **Pulmonary:** difficulty breathing (rales on auscultation due to fluid in lungs)
 - > **Hepatic:** upper abdominal pain, nausea/vomiting, liver enzymes elevated $> 2\times$ baseline
 - > **Renal:** serum creatinine > 1.1 mg/dL or doubling of baseline, oliguria (< 400 cc urine 24 hrs),
 - > **Hematologic:** Platelets $< 100,000$ cells/mL

Summary Guidance for Optimal Timing of Delivery for Severe Pre-Eclampsia

- **Gestational age < 24 weeks (pre-viable fetus)**
 - > MgSO₄, anti-hypertensive medications
 - > Induce labour
- **Gestational age 24-34 weeks**
 - > MgSO₄; anti-hypertensive medications; antenatal corticosteroids (ACS) if safety conditions met;
 - > Close maternal and fetal monitoring; expedite birth if maternal and fetus status not stable
- **Gestational age 34-36 6/7 weeks**
 - > Same management as for 24-34 weeks except **NO ACS**
- **Gestational age 37 0/7 weeks**
 - > MgSO₄, anti-hypertensive medications and expedite delivery

Prevention and Management of Infection in Pregnancy and Childbirth

Antibiotic use principles:

- Appropriate and inappropriate use of antibiotics for infection prevention and treatment
- Judicious use of antibiotics to reduce antimicrobial resistance (narrow spectrum antibiotic, correct dosing, duration)
- Monitoring local bacteria, antibiotic susceptibility and resistance patterns to inform antibiotic selection - where feasible.
- Avoiding and managing antibiotic allergies, including anaphylaxis

Differential Diagnosis of Fever during Pregnancy and Labor

Typical signs and symptoms (in addition to fever, chills)	Possible Diagnoses
Dysuria, frequency; flank pain (pyelonephritis)	Cystitis; acute pyelonephritis
Foul-smelling discharge, lower abdominal pain, uterine tenderness; maternal tachycardia, fetal tachycardia (amnionitis)	Septic abortion; amnionitis
Headache, muscle/joint pain; anaemia, coma, sometimes convulsions, jaundice (severe malaria)	Uncomplicated malaria; severe malaria
Cough with expectoration, chest pain; sometimes rapid/difficulty breathing, rhonchi/rales	Pneumonia
Dry cough, malaise, anorexia; sometimes confusion/stupor	Typhoid
Malaise, anorexia, nausea, dark urine/pale stool, jaundice	Hepatitis

Therapeutic Antibiotics for Selected Infections in Pregnant Women

Diagnosis	New in 2 nd edition	Comments
Cystitis	<p>Antibiotic options and dosing of either Amoxicillin or Nitrofurantoin remain the same, except:</p> <ul style="list-style-type: none"> • Avoid nitrofurantoin at term as it can cause neonatal haemolysis. • Removal of trimetoprim/sulfamethoxazole due to interference with the folic acid metabolism and increased risk of congenital malformations. 	<p>Amoxicillin 500 mg by mouth every 8 hours for 3 days, or Nitrofurantoin 100 mg by mouth every 8 hours for 3 days.</p>
Acute Pyelonephritis	<p>Antibiotic regimen IV Ampicillin PLUS Gentamicin followed by oral Amoxicillin remains the same, but added emphasis on the importance of identifying and treating pyelonephritis in pregnancy to prevent significant illness, and to re-evaluate diagnosis and choice of antibiotic if there is no clinical response in 48 hours.</p>	<p>Ampicillin 2 g IV every 6 hours, PLUS Gentamicin 5 mg/kg body weight IV every 24 hours; Amoxicillin 1 g orally every 8 hours to complete 14 days of treatment.</p>
Amnionitis	<p>Antibiotic regimen IV Ampicillin PLUS Gentamicin remains the same, but if the woman gives birth vaginally, continue treatment for at least 48 hours after the symptoms and signs of infection have subsided.</p>	<p>Ampicillin 2 g IV every 6 hours, PLUS Gentamicin 5 mg/kg body weight IV every 24 hours.</p>
Serious Infections of Pelvic Organs	<p>Antibiotic regimen narrowed to IV Ampicillin PLUS Gentamicin, deleting Metronidazole. Discontinue antibiotics 48 hours after complete resolution of clinical signs and symptoms.</p>	<p>Ampicillin 2 g IV every 6 hours, PLUS Gentamicin 5 mg/kg body weight IV every 24 hours.</p>
Pelvic Abscess, Peritonitis	<p>Antibiotic regimen remains the same: IV Ampicillin PLUS Gentamicin, PLUS Metronidazole.</p>	<p>Ampicillin 2 g IV every 6 hours, PLUS Gentamicin 5 mg/kg body weight IV every 24 hours, PLUS Metronidazole 500 mg IV every 8 hours.</p>

Additional ANC and MCPC resources are available on MCSP's website at:

- <https://www.mcsprogram.org/our-work/maternal-health/>
- http://www.who.int/maternal_child_adolescent/documents/managing-complications-pregnancy-childbirth/en/

And on the WHO website, at:

- http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/anc-positive-pregnancy-experience/en/
- http://www.who.int/maternal_child_adolescent/documents/managing-complications-pregnancy-childbirth/en/

Requests for further information on this PowerPoint should be addressed to MCSP Communications, e-mail: info@mcsprogram.org

For more information, please visit
www.mcspprogram.org

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