

WHO Recommendations on Antenatal Care for a Positive Pregnancy Experience: Summary

Highlights and Key Messages from the World Health Organization's 2016 Global Recommendations for Routine Antenatal Care

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Key messages

- World Health Organization's 2016 recommendations on antenatal care (ANC) for a positive pregnancy experience prioritize **person-centred health care, well-being of women** and families, and positive perinatal and maternal outcomes.
- Recommendations outline key elements of an **essential core package of routine ANC** needed by women and adolescent girls throughout the pregnancy period.
- Recommendations are **integrated** and include clinical ANC health promotion and nutritional interventions as well as prevention and early detection of selected pregnancy-related conditions and concurrent diseases including malaria, HIV, and TB.
- Recommendations also include **health-system interventions to improve the utilization and quality of ANC** and women's and adolescent girls' positive experience of pregnancy, with a recommendation for at least eight ANC contacts during pregnancy to improve perinatal outcomes and women's experience of care.
- The recommendations are designed to be **adaptable and flexible** so that countries with different settings, burdens of disease, social and economic situations, and health-system structures can adopt and implement the recommendations based on their country context and populations' needs.

Background

Approximately 303,000 women and adolescent girls died from pregnancy and childbirth-related complications in 2015.¹ That same year, 2.6 million babies were stillborn. Almost all of the maternal deaths (99%) and child deaths (98%) occurred in low- and middle-income countries. These maternal deaths could have been prevented if the pregnant women or adolescent girls had been able to access quality antenatal care (ANC).² Sixty percent of the stillbirths (1.46 million) occurred during the antepartum period and mainly due to untreated maternal infection, hypertension, and poor fetal growth.³

Recent evidence suggests that the focused antenatal care (FANC) model, which was developed in the 1990s, is associated with more perinatal deaths than ANC models that comprise at least eight contacts between the pregnant woman or adolescent girl and the health care provider.⁴ A secondary analysis of the World Health Organization's (WHO's) ANC Trial suggests that the increase in perinatal mortality rate is more likely due to an increase in stillbirths.⁵ These findings and other evidence informed the development of WHO's 2016 ANC recommendations.



¹ Alkema L, Chou D, Hogan D, Zhang S, Moller AB, Gemmill A, et al. Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: a systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group. *Lancet*. 2016;387(10017):462–474. doi:10.1016/S0140-6736(15)00838-7.

² Maternal mortality: fact sheet. Geneva: World Health Organization; 2016 (<http://www.who.int/mediacentre/factsheets/fs348/en/index.html>, accessed 10 January 2018).

³ Blencowe H, Cousens S, Jassir FB, Say L, Chou D, Mathers C, et al. National, regional, and worldwide estimates of stillbirth rates in 2015, with trends from 2000: a systematic analysis. *Lancet*. 2016;4(2):e98–108. doi:10.1016/S2214-109X(15)00275-2.

⁴ Vogel JP, Habib NA, Souza JP, Gülmezoglu AM, Dowswell T, Carroli G, et al. Antenatal care packages with reduced visits and perinatal mortality: a secondary analysis of the WHO Antenatal Care Trial. *Reproductive Health*. 2013;10(1):19. doi:10.1186/1742-4755-10-19.

⁵ Dowswell T, Carroli G, Duley L, Gates S, Gülmezoglu AM, Khan - Neelofur D, et al. Alternative versus standard packages of antenatal care for low-risk pregnancy. *The Cochrane Library*. 2015. doi:10.1002/14651858.CD000934.pub3.

This brief highlights the WHO’s 2016 ANC recommendations and offers countries **policy and program considerations** for adopting and implementing the recommendations. The recommendations include universal and context-specific interventions. The recommended interventions span five categories: routine antenatal **nutrition**, maternal and fetal **assessment**, **preventive measures**, interventions for management of common **physiologic symptoms** in pregnancy, and **health system-level interventions** to improve the utilization and quality of ANC.

The WHO 2016 recommendations for **routine ANC care** are intended to complement existing WHO guidelines on the management of **pregnancy-related complications**. The WHO considers good clinical practices such as routine screening for hypertensive diseases in pregnancy through regular monitoring of blood pressure, checking for fetal heart sounds, and counselling on birth preparedness and postpartum family planning, as established good practices. WHO did not evaluate evidence for such established good practices as part of its development of the 2016 ANC recommendations. Readers may refer to the full WHO ANC recommendations for an understanding of the methods, evidence base, and implementation considerations (available at http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/anc-positive-pregnancy-experience/en/).

WHO’s 2016 ANC Model

The 2016 WHO ANC model aims to provide pregnant women with respectful, individualized, person centred care at every contact and to ensure that each contact delivers effective, integrated clinical practices (interventions and tests), provides relevant and timely information, and offers psychosocial and emotional support by practitioners with good clinical and interpersonal skills working in a well-functioning health system. Given evidence that perinatal deaths increase with only four ANC visits and that an increase in the number of ANC contacts, regardless of the country, is associated with an increase in maternal satisfaction, WHO **recommends a minimum of eight contacts**: five contacts in the third trimester, one contact in the first trimester, and two contacts in the second trimester (see Table 1). WHO assumes each country will tailor the new model to its context based on the country’s defined core package of ANC services and consensus on *what* care is provided at each contact, *who* provides ANC care (which health cadre), *where* care is provided (which system level), and *how* care is provided (platforms) and *coordinated* across all eight ANC contacts.

Health system interventions to improve women’s and girls’ positive experience of pregnancy and the utilization and quality of ANC

Recommended **health system interventions** are intended to help countries operationalize the eight ANC contacts, to address continuity of care and health workforce constraints, and to improve communication with, and support, for women. Table 2 summarizes health system interventions recommended in all settings and health system interventions recommended in specific contexts and key considerations and rationale for each recommendation. **Case notes carried by women** during pregnancy are universally recommended to improve continuity and quality of care and their pregnancy experience. **Task-shifting** ANC activities to a broad range of cadres—lay health workers, auxiliary nurses, nurses, midwives, and doctors—is recommended for the promotion of health-related behaviours, distribution of recommended nutritional supplements, and provision of intermittent preventive treatment in pregnancy (IPTp) to prevent malaria. Policymakers should consider professional-support interventions that **recruit and retain qualified health workers** in remote and rural settings. **Midwife-led continuity-of-care** ANC models are recommended in settings with well-functioning midwifery programmes. Other contextual recommendations include the following: **community mobilization** through facilitated participatory learning and action cycles; and packages of interventions that include household and community mobilization and ANC home visits, particularly for women in rural settings. In the context of research, **group ANC** provided by qualified providers should be considered as an alternative to individual ANC service delivery models.

Table 1. 2016 WHO ANC model	
First trimester	
Contact 1: up to 12 weeks	
Second trimester	
Contact 2: 20 weeks	
Contact 3: 26 weeks	
Third trimester	
Contact 4: 30 weeks	
Contact 5: 34 weeks	
Contact 6: 36 weeks	
Contact 7: 38 weeks	
Contact 8: 40 weeks	
Return for delivery at 41 weeks if not given birth.	
Note: Intermittent preventive treatment of malaria in pregnancy should be started at ≥ 13 weeks.	

Table 2. Health systems interventions to improve the utilization and quality of antenatal care

WHO Recommendation 2016	Key considerations and rationale
Recommended for all settings	
E.1: It is recommended that each pregnant woman carries her own case notes during pregnancy to improve continuity, quality of care, and pregnancy experience.	<ul style="list-style-type: none"> Women are likely to favour carrying their case notes because of the increased opportunity to acquire pregnancy and health-related information and the associated sense of empowerment.
E.5.1: Task shifting the promotion of health-related behaviours for maternal and newborn health to a broad range of cadres, including lay health workers, auxiliary nurses, nurses, midwives, and doctors is recommended.	<ul style="list-style-type: none"> Task shifting allows flexibility in the health care setting in low- and middle-income countries. For more information, see <i>Optimizing health worker roles for maternal and newborn health</i>: http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/978924504843/en/.
E.5.2: Task shifting the distribution of recommended nutritional supplements and intermittent preventive treatment in pregnancy (IPTp) for malaria prevention to a broad range of cadres, including auxiliary nurses, nurses, midwives, and doctors is recommended.	<ul style="list-style-type: none"> The overall mandate of task shifting programmes needs to be clearly defined and supported by key stakeholders. Lay health workers need to be recognized and integrated into the system and not work alone.
E.7: ANC models with a minimum of eight contacts are recommended to reduce perinatal mortality and improve women's experience of care.	<ul style="list-style-type: none"> Evidence suggests that the FANC model developed in the 1990's is probably associated with more perinatal deaths than the ANC models that emphasize at least eight contacts. The 2016 recommendations add three visits to the third trimester for a total of five contacts—in contrast to the two visits in the FANC model. During third-trimester contacts, ANC providers should reduce preventable morbidity and mortality rates through systematic monitoring of maternal and fetal well-being, particularly in relation to hypertensive disorders and other detectable conditions in this critical period.
Recommended in specific contexts	
E.2: 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 for pregnant women in settings with well-functioning midwifery programmes.	<ul style="list-style-type: none"> The midwifery model provides care to healthy women with uncomplicated pregnancies, with a strong focus on woman-centred care. Deployment, training, and ongoing support of midwives, as well as monitoring for the adequate number of midwives needed to provide quality care, are essential in ensuring that the model's philosophy is implemented and that the model's application is sustained.
E.4.1: The implementation of community mobilization through facilitated participatory learning and action 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.	<ul style="list-style-type: none"> The pathways of influence are difficult to assess because the intervention is multifaceted and context specific. Meetings where women identify needs and seek solutions play an important role; mechanisms related to the activities that are undertaken, as a part of the solution, may also play a role. Evidence with a grade of low certainty suggests that the use of women's groups in the provision of ANC services may reduce maternal mortality.
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.	<ul style="list-style-type: none"> These visits do not replace ANC, but they may be helpful in ensuring that there is continuity of care and promotion of healthy behaviours. Interventions that strengthen health systems should be implemented alongside these community-based interventions.
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.	<ul style="list-style-type: none"> This recommendation is adapted from WHO's 2010 publication: <i>Increasing access to health workers in remote and rural areas through improved retention: global policy recommendations</i> (http://www.who.int/hrh/retention/guidelines/en/).
Recommended only in the context of research	
E.3: Group antenatal care provided by qualified health care professionals may be offered as an alternative to individual antenatal care for pregnant women, depending on a woman's preferences and provided the infrastructure and resources for delivery of group antenatal care are available.	<ul style="list-style-type: none"> Health care facilities need to see a sufficient number of pregnant women to implement group ANC because women should be grouped by gestational age. Health care providers need to have appropriate facilities to support group sessions, including having access to large, well-ventilated rooms or sheltered spaces with adequate seating. A private space should be available for examinations, and opportunities should be given for private conversations between the woman and the health care provider.

Nutrition interventions, maternal and fetal assessment, preventive measures, and interventions for common physiologic symptoms

In addition to health system recommendations to improve ANC quality and utilization, WHO's 2016 ANC recommendations address interventions in four other categories: nutrition, maternal and fetal assessment, preventive measures, and management of common physiologic symptoms in pregnancy. As noted in the health systems interventions, WHO categorizes the recommendations by implementation setting and also provides key considerations and rationale for each intervention (see Tables 3–6).

Table 3. Nutrition interventions addressed by WHO's 2016 recommendations

WHO Recommendation 2016	Key considerations and rationale
Recommended in all settings	
A.1.1: Provide counselling about healthy eating, and keeping physically active to stay healthy and prevent excessive weight gain during pregnancy.	<ul style="list-style-type: none"> In resource-poor countries in sub-Saharan Africa and south-central and Southeast Asia, maternal undernutrition is highly prevalent and recognized as a key determinant of poor perinatal outcomes. Obesity and overweight are also associated with poor pregnancy outcomes. A healthy diet provides energy, protein, vitamins, and minerals, obtained from a variety of foods. A healthy diet includes green and orange vegetables, meat, fish, beans, nuts, whole grains, and fruit. Normal gestational weight gain occurs after 20 weeks gestation. Normal weight may be subject to regional variations; consider prepregnancy body mass index and Institute of Medicine's classifications, which includes women who are underweight at the start of pregnancy (i.e., under 18.5 kg/m²) and who should aim to gain 12.5–18 kg. For further information, see <i>New recommendations for total and rate of weight gain during pregnancy, by prepregnancy</i>: https://www.ncbi.nlm.nih.gov/books/NBK32799/table/summary.t1/?report=objectonly.
A.2.1: Provide daily oral iron and folic acid supplementation with 30 to 60 mg of elemental iron and 400 µg (0.4 mg) of folic acid to prevent maternal anaemia, puerperal sepsis, low birthweight, and preterm birth.	<ul style="list-style-type: none"> Common causes of anaemia include iron deficiency, infections (e.g., malaria, hookworm), and chronic diseases (e.g., HIV). In settings with high prevalence of significant anaemia in pregnancy (i.e., at least 40% of pregnant women have a blood haemoglobin [Hb] concentration lower than 110 g/L), a daily dose of 60 mg of elemental iron is preferred over a lower dose. If a woman is diagnosed with anaemia during pregnancy, her daily elemental iron should be increased to 120 mg until her Hb concentration rises to normal (110 g/L or higher). Effective communication with pregnant women about diet and healthy eating, including counselling on food sources of vitamins and minerals, and dietary diversity, is an integral part of preventing anaemia. Effective communication strategies are vital for improving acceptability and adherence to supplementation schemes (e.g., managing side effects). Stakeholders may consider task shifting which health care cadre provides iron supplementation in community settings with poor access to health professionals.
Recommended in specific contexts	
A.1.2: In undernourished populations, nutrition education and counselling to increase daily energy and protein intake is recommended to reduce risk of low-birthweight new-borns.	<ul style="list-style-type: none"> Undernourishment is usually defined by low (or underweight) body mass index that is under 18.5 kg/m². Regularly assess the prevalence of undernutrition. Among adults in a given setting, if 20–39% of women in the population are underweight, then this prevalence is considered high; a prevalence rate that is 40% or more is very high. Consider alternative delivery platforms (peer counsellors) and task shifting for nutrition education and counselling supported by a strong training package with standardized nutrition guidance.
A.1.3: In undernourished populations, balanced energy and protein dietary supplementation is recommended to reduce risk of stillbirths and small-for-gestational-age new-borns.	<ul style="list-style-type: none"> This recommendation is for populations or settings with a high prevalence of undernourished pregnant women, not for an individual pregnant woman identified as being undernourished. Consider local production of supplements to minimize costs and logistics and to ensure that there is an adequate supply of supplements; establish quality assurance processes to guarantee that supplements are manufactured, packaged, and stored in a controlled, uncontaminated environment.
A.2.2: Intermittent oral iron and folic acid supplementation with 120 mg of elemental iron and 2800 µg (2.8 mg) of folic acid once weekly is recommended to improve maternal and newborn outcomes if daily iron is not acceptable	<ul style="list-style-type: none"> This guidance supersedes WHO's 2012 recommendations (see <i>Daily iron and folic acid supplementation in pregnant women</i>). This recommendation must be considered alongside Recommendation A.2.1.

WHO Recommendation 2016	Key considerations and rationale
due to side effects and in populations with an anaemia prevalence among pregnant women of less than 20%.	
A.3: In populations with low dietary calcium intake, daily calcium supplementation (1.5–2 g oral elemental calcium) is recommended to reduce risk of pre-eclampsia.	<ul style="list-style-type: none"> Dietary counselling of pregnant women should promote adequate calcium intake through locally available, calcium-rich foods. Dividing the dose of calcium may improve acceptability. Calcium supplementation should be 1.5–2.0 g daily, with the total amount divided into three doses, preferably taken at mealtimes. To reach the most vulnerable, consider task shifting of cadres to provide calcium supplements to pregnant women in communities that have poor access to health professionals.
A.4: Vitamin A supplementation is only recommended for pregnant women in areas where vitamin A deficiency is a severe public health problem, to prevent night blindness.	<ul style="list-style-type: none"> Vitamin A is not recommended to improve maternal or perinatal outcomes. When supplementation is indicated, such as in areas where Vitamin A deficiency is considered a severe public health problem, give vitamin A daily or weekly (up to 10,000 IU per day or weekly dose of up to 25,000 IU) to prevent night blindness.
A.10: For pregnant women with high daily caffeine intake (over 300 mg per day), lowering daily caffeine intake during pregnancy is recommended to reduce the risk of pregnancy loss and low-birthweight new-borns.	<ul style="list-style-type: none"> Caffeine is a stimulant found in tea, coffee, soft drinks, chocolate, kola nuts, and some over-the-counter medicines. Coffee is probably the most common source of high-caffeine intake. Pregnant women should be informed that a daily intake of over 300 mg of caffeine is probably associated with a higher risk of pregnancy loss and having a low-birthweight newborn.
Only recommended in the context of research	
A.5: Zinc supplementation is only recommended for pregnant women in the context of rigorous research.	<ul style="list-style-type: none"> Evidence graded as low certainty suggests that zinc supplementation may reduce preterm birth, and this finding warrants further investigation, particularly with regard to food fortification strategies.

Table 4. Maternal and fetal assessment

WHO Recommendation 2016	Key considerations and rationale
Recommended in all settings	
B.1.4: Classify hyperglycaemia first detected at any time during pregnancy as either gestational diabetes mellitus (GDM) or diabetes mellitus in pregnancy, according to WHO criteria.	<ul style="list-style-type: none"> WHO currently does not have a recommendation on whether or how to screen for GDM in all pregnant women; the usual time period for diagnosing GDM is at 24–28 weeks gestation. Uncertainties persist about the cost effectiveness of screening strategies, the prevalence of GDM and diabetes mellitus in diverse populations, and the impact of an earlier diagnosis on pregnancy outcomes. Women whose hyperglycaemia (diabetes mellitus, GDM) is detected during pregnancy are at greater risk of experiencing adverse pregnancy outcomes including macrosomia, pre-eclampsia/hypertensive disorders, and/or shoulder dystocia. GDM treatment can reduce the likelihood of having these poor outcomes.
B.1.5: Ask about tobacco use (past and present) and exposure to second-hand smoke as early as possible in pregnancy and at every ANC visit.	<ul style="list-style-type: none"> Health care providers should routinely offer advice and psychosocial interventions for tobacco cessation or for reducing exposure to second-hand smoke, or both. For further guidance, see <i>WHO recommendations for the prevention and management of tobacco use and second-hand smoke exposure in pregnancy</i>: http://www.who.int/tobacco/publications/pregnancy/guidelinestobaccosmokeexposure/en/.
B.1.6: Ask about use of alcohol and other substances (past and present) as early as possible in pregnancy and at every ANC visit.	<ul style="list-style-type: none"> Routinely asking about alcohol use is important as some women are more likely to report sensitive information only after a trusting relationship is established. Health care providers should be prepared to intervene if addiction to alcohol or another substance is present. For further guidance, see <i>Guidelines for identification and management of substance use and substance use disorders in pregnancy</i>: http://www.who.int/substance_abuse/publications/pregnancy_guidelines/en/.
B.1.7: In high-prevalence settings, implement provider-initiated testing and counselling for HIV in all ANC settings. In low-prevalence settings, provider-initiated testing and counselling can be considered in ANC settings as a key component of the effort to eliminate mother-to-child transmission of HIV; integrate HIV testing with syphilis, viral, or other key tests, as	<ul style="list-style-type: none"> Availability of testing often determines a high level of knowledge of HIV status among women, thus expanding the benefits of antiretroviral treatment. For further guidance on HIV testing, see <i>Consolidated guidelines on HIV testing services</i>: http://www.who.int/hiv/pub/guidelines/hiv-testing-services/en/. In addition, see <i>Guideline on when to start antiretroviral therapy and on pre-exposure prophylaxis for HIV</i>: http://www.who.int/hiv/pub/guidelines/earlyrelease-arv/en/.

WHO Recommendation 2016	Key considerations and rationale
relevant to setting; and strengthen underlying maternal and child health systems.	
<p>B.2.4: Provide one ultrasound scan before 24 weeks gestation (early ultrasound) to estimate gestational age (GA), improve detection of fetal anomalies and multiple pregnancies, reduce induction of labour for post-term pregnancy, and improve pregnancy experience.</p>	<ul style="list-style-type: none"> • A routine ultrasound scan after 24 weeks gestation is not recommended for pregnant women who have had an early ultrasound scan. However, stakeholders may consider a later ultrasound scan to identify the number of foetuses, fetal presentation, and placental location if an early ultrasound scan has not been performed. • An early ultrasound scan that is performed correctly increases the accuracy and precision of gestational age assessment, which can support appropriate management of threatened preterm birth and post-term pregnancies. • Health system support for a minimum standard of ultrasound services, appropriate referral, and management of complications identified by ultrasound is essential. See WHO's 2016 ANC Ultrasound Policy Brief (http://apps.who.int/iris/bitstream/10665/259946/1/WHO-RHR-18.01-eng.pdf).
Recommended in specific contexts	
<p>B.1.1: Full blood count testing is the recommended method for diagnosing anaemia in pregnancy. In settings where full blood count testing is not available, on-site haemoglobin testing with a haemoglobinometer is recommended over the use of the haemoglobin colour scale as the method for diagnosing anaemia in pregnancy.</p>	<ul style="list-style-type: none"> • The haemoglobinometer test is both more sensitive and specific in detecting moderate-severe anaemia than a haemoglobin colour scale. • Developing and/or investigating other low cost, onsite detection methods is warranted.
<p>B.1.2: Midstream urine culture is the recommended method for diagnosing asymptomatic bacteriuria (ASB) in pregnancy. In settings where urine culture is not available, on-site midstream urine Gram-staining is recommended over the use of dipstick tests as the method for diagnosing ASB in pregnancy.</p>	<ul style="list-style-type: none"> • This recommendation must be considered alongside Recommendation C.1 (ASB treatment) (see Table 5). • ASB is a priority topic for research.
<p>B.1.3: Clinical enquiry about the possibility of intimate partner violence (IPV) should be strongly considered at ANC visits when assessing conditions that may be caused or complicated by IPV so that clinical diagnosis and subsequent care can be improved. This intervention is only appropriate where there is the capacity to provide a supportive response (including referral where needed) and where the WHO minimum requirements are met.</p>	<ul style="list-style-type: none"> • “Universal screening” or “routine enquiry” (i.e., asking all women at all health care encounters) about IPV is not recommended. • However, WHO’s recommendations identify ANC as a setting where routine enquiry can be implemented if providers are well trained in a first-line response, and minimum requirements are met. • Minimum conditions for health care providers to ask and discuss IPV with women are: it is safe to do so (i.e., the woman’s partner is not present) and IPV identification of IPV is followed by an appropriate response. • Providers must be trained to correctly ask questions and appropriately respond to women who disclose IPV. • To determine if WHO’s minimum requirements are met, health care providers should refer to <i>Responding to intimate partner violence and sexual violence against women</i>: http://www.who.int/reproductivehealth/publications/violence/9789241548595/en/.
<p>B.1.8: In settings where TB prevalence in the general population is 100 per 100,000 people or higher, systematic screening for active TB should be considered for pregnant women as part of ANC.</p>	<ul style="list-style-type: none"> • TB increases the risk of preterm birth, perinatal death, and other pregnancy complications. • Early initiation of TB treatment rather than a later initiation is associated with better maternal and newborn outcomes. • To better understand the local burden of TB in pregnancy, health systems should capture pregnancy status in registers that track TB screening and treatment. • For further information, see <i>Systematic screening for active tuberculosis: principles and recommendations</i>: http://www.who.int/tb/tbscreening/en/.
<p>B.2.2: Replacing abdominal palpation with symphysis-fundal height (SFH) measurement for the assessment of fetal growth is not recommended to improve perinatal outcomes. A change from what is usually practiced (abdominal palpation or SFH measurement) in a particular setting is not recommended.</p>	<ul style="list-style-type: none"> • SFH measurement is routinely practiced in many ANC settings. Due to a lack of clear evidence of accuracy or superiority of either SFH measurement or clinical abdominal palpation to assess fetal growth, the WHO does not recommend a change in practice. • SFH lacks evidence, rather than effectiveness, particularly in low- and middle-income countries.

WHO Recommendation 2016	Key considerations and rationale
Recommended only in the context of research	
B.2.1: Daily fetal movement counting, such as with “count-to-10” kick charts is only recommended in the context of rigorous research.	<ul style="list-style-type: none"> Counting <i>routine</i> daily fetal movements is not recommended; however, healthy pregnant women should be made aware of the importance of fetal movements in the third trimester and of reporting reduced fetal movements to their health care provider. During an ANC contact, providers should enquire about maternal perception of fetal movements as part of good clinical practice. Women who perceive poor or reduced fetal movements require further monitoring (e.g., counting daily fetal movements) and investigation, if indicated.

Table 5. Preventive measures

WHO Recommendation 2016	Key considerations and rationale
Recommended in all settings	
C.1: Provide a seven-day antibiotic regimen for pregnant women with asymptomatic bacteriuria (ASB) to prevent persistent bacteriuria, preterm birth, and low birthweight.	<ul style="list-style-type: none"> ASB is a priority research topic given its association with preterm birth. Stakeholders may wish to consider context-specific screening and treatment in conjunction with preterm birth prevalence. Evidence on preterm birth is graded as low certainty; trials are needed to evaluate the effects on preterm birth and perinatal mortality in low- and middle-income countries. Preterm birth indicators and antimicrobial resistance should be monitored.
C.5: Provide tetanus toxoid vaccination for all pregnant women, depending on previous tetanus vaccination exposure, to prevent neonatal mortality from tetanus.	<ul style="list-style-type: none"> This recommendation is consistent with what is stated in WHO’s <i>Maternal immunization against tetanus</i> (http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/immunization_tetanus.pdf): <ul style="list-style-type: none"> If a pregnant woman has not previously been vaccinated or if her immunization status is unknown, she should receive two doses of tetanus toxoid-containing vaccine (TTCV) 1 month apart, with the second dose given at least 2 weeks before delivery. In most people, two doses protect against tetanus infection for 1–3 years. A third dose is recommended 6 months after the second dose, which should extend the vaccine’s protection to at least 5 years. Two further doses for women who are first vaccinated against tetanus during pregnancy should be given after the third dose, in the 2 subsequent years or during two subsequent pregnancies. If a woman has received one to four doses of a TTCV in the past, she should receive one dose of TTCV during each of her subsequent pregnancies, for a total of five doses (five doses protects a woman throughout the childbearing years). At each ANC contact, ANC providers should verify the vaccination status of pregnant women and administer vaccines recommended in the national immunization schedule. ANC contacts are also opportunities to explain the importance of infant vaccination and to communicate the infant/child vaccination schedule to pregnant women.
Recommended in specific contexts	
C.4: In endemic areas, preventive anthelmintic treatment is recommended for pregnant women after the first trimester as part of worm infection reduction programmes.	<ul style="list-style-type: none"> Endemic areas are areas where prevalence of hookworm and/or whipworm infection is 20% or more and prevalence of anaemia among pregnant women is 40% or higher. Safety has not been unequivocally established for use of these anthelmintic drugs in pregnancy, but the benefits of taking these medicines are considered to outweigh the disadvantages.
C.6: In malaria-endemic areas in Africa, intermittent preventive treatment with sulfadoxine-pyrimethamine (IPTp-SP) is recommended for all pregnant women. ⁶ Dosing should start in the second trimester and be given at least one month	<ul style="list-style-type: none"> The 2016 ANC IPTp recommendation is based on WHO’s <i>Guidelines for the treatment of malaria, third edition</i> (www.who.int/malaria/publications/atoz/9789241549127/en/). Highlights include the following: <ul style="list-style-type: none"> Malaria infection during pregnancy carries substantial risks for the mother, her fetus, and the newborn. WHO-recommended malaria prevention and control interventions include promotion and use of insecticide-treated nets, appropriate and prompt case management, and administration of IPTp-SP in areas with moderate-to-high transmission of <i>Plasmodium falciparum</i>. Three or more doses of SP, compared to only two doses, are associated with reduced maternal parasitaemia, fewer low-birthweight infants, and increased mean birthweight. Pregnant women in malaria-endemic areas should start IPTp-SP as early as possible in the second

⁶ This recommendation should be followed to treat all pregnant women who are not receiving cotrimoxazole.

WHO Recommendation 2016	Key considerations and rationale
apart, with the objective of ensuring that at least three doses are received.	<p>trimester (i.e., 13 weeks); policymakers should promote health system's contact with women at 13 weeks gestation.</p> <ul style="list-style-type: none"> – SP acts by interfering with folic acid synthesis in the parasite carrying malaria. There is some evidence that high doses of supplemented folic acid (i.e., at least 5 mg daily) may interfere with SP's efficacy in pregnant women. Countries should ensure that they procure and distribute folic acid supplements for antenatal use at the recommended antenatal dosage (i.e., 0.4 mg daily).
C.7: Oral pre-exposure prophylaxis containing tenofovir disoproxil fumarate should be offered as an additional prevention choice for pregnant women at substantial risk of HIV infection as part of combination prevention approaches.	<ul style="list-style-type: none"> • Being at substantial risk is defined as living in an area with an HIV incidence rate that is greater than 3 per 100 person-years and not taking pre-exposure prophylaxis. However, individual risk for HIV varies depending on individual behaviour and the characteristics of sexual partnerships. Local epidemiological evidence concerning risk factors and HIV incidence should be used to inform implementation. • For further information, see <i>Guideline on when to start antiretroviral therapy and on pre-exposure prophylaxis for HIV</i> (http://www.who.int/hiv/pub/guidelines/earlyrelease-arv/en/).
Recommended only in the context of research	
C.2: Administration of antibiotic prophylaxis to prevent recurrent urinary tract infections in pregnant women is only recommended in the context of rigorous research.	<ul style="list-style-type: none"> • Further research is needed to determine the best strategies for preventing recurrent urinary tract infections during pregnancy, including the effects of antibiotic prophylaxis on pregnancy-related outcomes and in antimicrobial resistance.
C.3: Administration of antenatal prophylaxis with anti-D immunoglobulin in non-sensitized, Rh-negative pregnant women at 28 and 34 weeks gestation to prevent Rhesus D alloimmunization, is only recommended in the context of rigorous research	<ul style="list-style-type: none"> • This research recommendation relates to the provision of anti-D prophylaxis during pregnancy and not to the practice of giving anti-D antigen after childbirth, for which there is high-certainty evidence of its effect in reducing RhD alloimmunization in subsequent pregnancies. Anti-D immunoglobulin should still be postnatally given when indicated.

Table 6. Recommended interventions for management of common physiological symptoms in pregnancy

Symptom	Interventions <i>Adapt and implement based on the options available and a woman's preference.</i>
Recommended in all settings	
Nausea and vomiting	D.1: Ginger, chamomile, vitamin B6, and/or acupuncture for relief of nausea in early pregnancy
Heartburn	D.2: 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	D.3: Magnesium, calcium, or nonpharmacological treatment options for relief of leg cramps in pregnancy
Low back/pelvic pain	D.4: Regular exercise throughout pregnancy to prevent low back/pelvic pain; different treatment options can be used, such as physiotherapy, support belts, and acupuncture
Constipation	D.5: Fibre supplements to relieve constipation in pregnancy if the condition fails to respond to dietary modification
Varicose veins and oedema	D.6: Nonpharmacological options such as compression stockings, leg elevation, and water immersion for management of varicose veins and oedema in pregnancy

Policy and Programme Considerations

The goal of the WHO 2016 ANC recommendations is to improve utilization and quality of routine ANC care within the context of person-centred health and well-being as part of a broader, rights-based approach. Successful implementation of these recommendations requires the **integrated delivery of maternal, nutrition, immunization, antimalarial, TB, and HIV interventions using ANC as the common platform**. Because ANC is often an under-

utilized platform for maternal and perinatal health, ANC interventions that are provided through an integrated service delivery platform can support efforts to strengthen health systems.⁷ Countries will vary by which recommended ANC interventions are being applied, need to be introduced, or need to be delivered with higher quality. Countries are encouraged to disseminate the recommendations among key constituents and to engage a **multistakeholder process** to develop a **costed, operational ANC roadmap** to adopt and implement the recommendations—either as part of a national maternal, neonatal, and child health (MNCH) strategy or an ANC-specific strategy. Key stakeholders to consider engaging include representatives from the following groups: Ministry of Health’s MNCH, malaria, TB, HIV, and nutrition departments; Ministry of Health’s implementing partners; education and finance ministry; educational institutions; professional associations; the private sector; community leaders; women’s groups; and consumer groups. Selected policy and program considerations are presented below.

National policy considerations

- Review the country’s epidemiologic context to determine which contextual and universal recommendations to adopt.
- Review established ANC service delivery platforms and country health system assets to define the health system interventions and associated policies to adopt (e.g., develop an ANC task-shifting policy).
- Review and update national ANC clinical protocols, norms, and standards based on the recommendations adopted.
- Analyse projected costs to implement the country’s ANC roadmap, and link the roadmap to a financing plan.

Program implementation considerations

Governance and engagement of key actors across system levels

- Effective implementation of the 2016 ANC recommendations will require leadership and the engagement of key actors across the health system.
- Key actors in many settings may include national policymakers, regional/district managers in the Ministry of Health, facility managers, facility health care workers, community leaders and health agents, and women and families.
- Ideally, a country’s ANC roadmap will include a specific plan to engage health care workers in the private sector.
- Communities’ and women’s representatives can advocate for the inclusion of women’s and families’ needs and preferences in the design and implementation of a country’s updated ANC model.

Information systems

- Review and update ANC indicators to incorporate in the country’s Health Management Information System, so they can be used by key actors and stakeholders.
- Review and update (or introduce) standardized ANC registers, women-held case notes and other data tools needed to track prioritized ANC data (at all system levels and all ANC contact sites).

Commodities and logistical support

- Plan how to procure, distribute, and finance new ANC commodities.
- Strengthen logistics systems for essential ANC commodities.
- Ensure that there is availability of ANC records and registers (at all ANC contact sites).

Human resources support

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

⁷ Tunçalp O, Pena-Rosas JP, Lawrie T, Bucagu M, Oladapo OT, Portela A, et al. WHO recommendations on antenatal care for a positive pregnancy experience-going beyond survival. *BJOG: International Journal of Obstetrics & Gynaecology*. 2017;124(6):860–862. doi:10.1111/1471-0528.14599.

- Collaborate with educational institutions and the government to develop a competency-based curriculum that helps students acquire person-centred ANC skills to implement the new ANC recommendations.
- Review and update pre- and in-service ANC training, ANC educational and supervision strategies, and ANC-specific materials/job aids.
- Explore innovative capacity-building approaches to sustain delivery of high-quality ANC services that align with WHO's recommendations.
- Develop/update patient communication and counselling materials for promotion of healthy behaviours.

ANC model—organization and delivery of ANC contacts

- Develop a sustainable ANC service delivery model for the country's context, which defines how services will be organized to deliver a core ANC package, specifically which set of interventions will be provided at each ANC contact and by whom (cadre), where (system level), and how (platform).
- Define mechanisms to ensure that there is coordination of care across ANC contact points, including community-to-facility linkages and supportive oversight of community-based services, activities, and auxiliary health workers.
- Support reorganization of ANC services and/or client flow, as needed, to reduce wait times, improve efficiency of service delivery, and satisfaction among clients and providers.
- Support activities to improve the quality of ANC services, including supporting teams and health workers to identify and overcome key health system and local service delivery barriers in order to provide evidence-based respectful ANC services, 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.
- Define and implement program activities to promote women's access to timely and relevant information about physiologic, biomedical, behavioural, and sociocultural issues; and provide effective and respectful social, emotional, and psychological support to women during pregnancy.

Monitoring, evaluation, and programme learning

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

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